TECHNOLOGY DEPARTMENT

APRIL 1950

Flow

OF MATERIALS THROUGH PROPER HANDLING AND PACKAGING METHODS

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DETROIT

THIS ISSUE

...for completely dependable service!

Thermoid conveyor belts, hose, other rubber products and brake linings are built to meet your requirements.

Thermoid distributors and field representatives are familiar with industry's day-by-day problems and have a wealth of experience in solving problems similar to yours. You receive the best available advice and practical down-to-earth recommendations whenever you take your rubber problems to Thermoid.

Thermoid's planned program of product research and development assures you of maximum service and lowest operating costs whenever you specify Thermoid Industrial Rubber Products.

It will pay you to *Specify* Thermoid!

Thermoid Quality Products: Transmission Belting • F.H.P. and Multiple V-Belts • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Molded Products • Industrial Brake Linings and Friction Materials.

Write for latest Thermoid Catalog Digest and the name of your nearest Thermoid Distributor

Thermoid Company

Main Offices and Factory • Trenton, N. J., U. S. A.
Western Offices and Factory • Nephi, Utah, U.S.A.
Industrial Rubber Products • Friction Materials • Oil Field Products

WHY DON'T YOU SAVE THIS KIND OF MATERIAL HANDLING MONEY?

CASE HISTORIES

Reveal 50% to 75% Cut in Costs With Automatic Electric Truck Handling

PAPER & PRINTING

Handling, Storing Flat Paper Stock

OLD METHOD

Skid loads moved and stored by 2 men with hand trucks.

2 MEN X 8 HOURS . . .
. . . 16 MAN-HOURS PER DAY

NEW METHOD

1 MAN with
1 AUTOMATIC TRANSTACKER

1 MAN X 8 HOURS . . .
. . . 8 MAN-HOURS PER DAY

SAVINGS 8 MAN-HOURS PER DAY at $1.00 per hour. . . . $8.00 per day

ANNUAL SAVINGS $2,000.00

BONUS . . . 2900 additional sq. ft. storage space at 80c per sq. ft. . $2,320.00

TOTAL ANNUAL SAVINGS $4,320.00

ELECTRIC APPLIANCES

Unloading Radio Cabinets

OLD METHOD

Cabinets unloaded from car and moved by hand truck.

To unload one car
25 MAN-HOURS
LABOR COST per car $32.75

NEW METHOD

2 MEN with 2 AUTOMATIC SKYLIFTS 6 MAN-HOURS

To unload one car
SAVED PER CAR . . .
. . . 19 MAN-HOURS.

LABOR COST
Saved per car. . . . $24.89

250 CARS . . .
Man-Hours Saved. 4,750

250 CARS . . .
HANDLING COSTS SAVED
$6,222.50

METAL PRODUCTS

Handling Tinplate

OLD METHOD

Moving heavy tinplate in bundles weighing 2,800 pounds each from freight car to storage by hand truck

To unload one freight car
9 MEN 3 hours . . 27 MAN-HOURS

NEW METHOD

3 MEN with 3 TRANSPORTERS
To unload one freight car
3 MEN 1 HOUR. . . . . 3 MAN-HOURS
SAVINGS PER CAR . . . . 24 MAN-HOURS

LABOR COST SAVED PER CAR
24 Man-Hours X $1.00 per hour. $24.00

BONUS 6 additional men available for more productive work

WAREHOUSING

Handling Building Materials

OLD METHOD

Unloading flat cars of insulating board and moving to storage by hand truck manual operation.

COST OF UNLOADING AND STORING $28.00

NEW METHOD

1 OPERATOR and
1 HELPER with
1 AUTOMATIC ELECTRIC FORK TRUCK

COST OF UNLOADING AND STORING. . $4.50

SAVING PER FLAT CAR
$23.50

PLUS A BONUS of 60% increase in usability of warehouse space.

All American Industry is using this service-proved, Automatic Electric Truck way to cut material handling costs 50% to 75% . . . to end back-breaking labor, cut down accidents, product damage.

Read the case histories on this page. They are typical of many in our files. *YOU* can save that kind of money too, no matter what your product.

Whether it's the Transporter, that lifts and moves tons of your product with easy finger-tip control, or the Transtacker or Automatic Skylift Electric Trucks that *stack* as well as lift and move your material, these brawny electric trucks save you costly man-hours, pay for themselves in as little as months.

Daily battery charging cost amounts to pennies, not dollars, and maintenance cost is insignificant. Send for FREE CATALOG *"How to make your Material Handling Pay Dividends"*. . . and see how *you* can save the kind of money reported in these case histories. Mail coupon.

MAIL COUPON FOR FREE CATALOG

Trade **Automatic** Mark
141 W. 87th Street
Dept. D-5, Chicago 21, Illinois

Please send me your FREE CATALOG "How to Make Your Material Handling Pay Dividends" with additional case histories showing typical savings in my business.

Company Name.....

By.....*Position*.....

Street Address.....

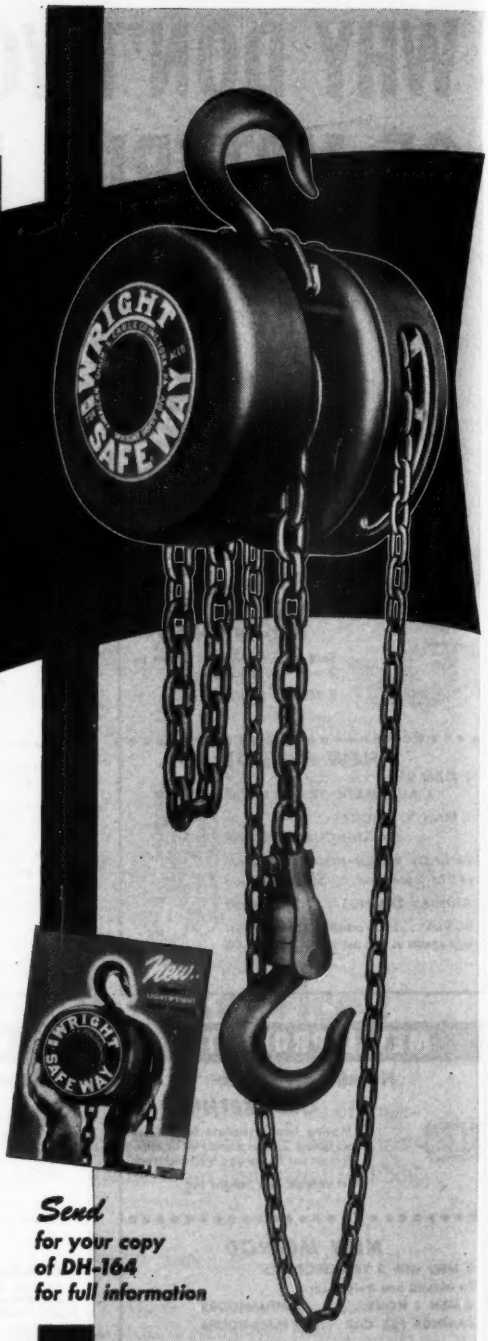
City.....*Zone*.....*State*.....

NEW

WRIGHT Safeway

...NEW

—from TOP HOOK to LOAD HOOK!



• This chain hoist was developed to help reduce materials handling costs through greater efficiency, speed and safety. Its design and light weight make it easy to handle. Simple design and enclosed construction—accurately made steel load chain, heat-treated and proof-tested—an unusual system of lubrication—reversible load wheel—drop forged hooks—these and many other features make the **Safeway** the big value hoist. Value in terms of efficient, high speed operation; long life and low maintenance cost.

Send for your copy of DH-164 for full information

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AMERICAN CHAIN & CABLE

HOISTS
TROLLEYS
CRANES

TRADE MARK

In Business for Your Safety

Flow

FLOW is not the official publication of any group, society or other special interest and consequently its editorial pages are unbiased and undominated.

VOL. 5, NO. 7 • APRIL, 1950

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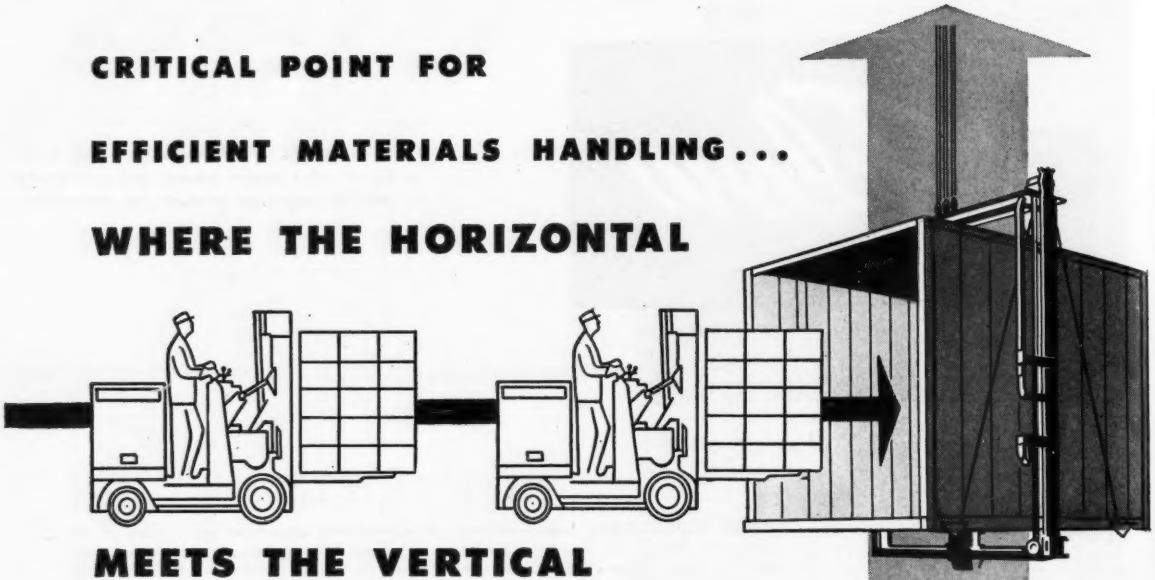
CRITICAL POINT FOR

EFFICIENT MATERIALS HANDLING...

WHERE THE HORIZONTAL



MEETS THE VERTICAL

Stop thinking of materials handling as merely a horizontal operation. Hand trucks, power trucks, conveyor belts, etc., are only one side of the story. At some point these elements meet up with the vertical—your freight elevators.

And unless your freight elevators are a planned part of your overall materials handling system, the efficient flow of materials is interrupted . . . and your handling costs rise.

To help you plan vertical transportation that meshes with your horizontal, Westinghouse has produced a new book, "The Buyer's Guide For Freight Elevators"* (B-4402). This book, the most complete source of information available on freight elevators, can only be obtained by requesting it on your company letterhead. Write Elevator Division, Dept. L, Westinghouse Electric Corporation, Jersey City, N. J. J-98564

WESTINGHOUSE FREIGHT ELEVATORS

YOU CAN BE SURE...IF IT'S Westinghouse

HAVE

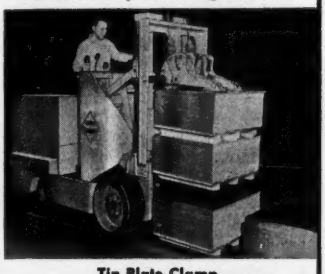
ELWELL-PARKER

solve your

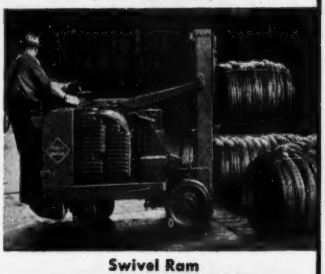
Special

handling problems

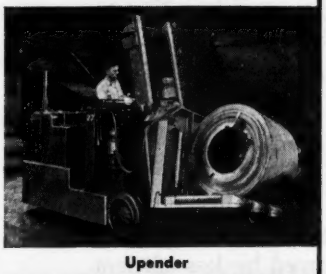
Side Dump Revolving Unit



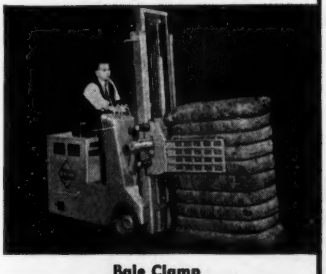
Tin Plate Clamp



Swivel Ram



Upender



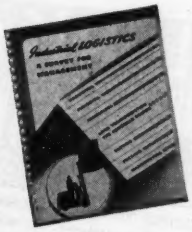
Bale Clamp

Pallet Retriever

Illustrated are just a few examples of E-P *versatility* in meeting unusual requirements. For Elwell-Parker devises special attachments and units where a "standard" truck will not do your job.

These "specials" are a product of Elwell-Parker's *unexcelled* experience gained in the past 42 years while supplying trucks for over 300 different industries. Indeed, owners of mixed fleets usually turn to Elwell-Parker when they have special requirements.

If your materials handling is "different", Elwell-Parker's versatile experience will supply you with trucks *exactly* suited to your needs. The Elwell-Parker Electric Company, 4234 St. Clair Ave., Cleveland 3, O.

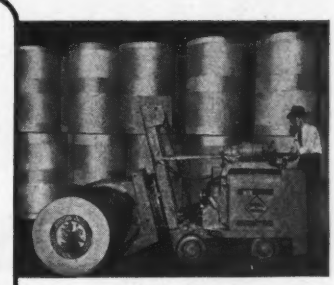


FREE BOOKLET explains Scientific materials handling in your particular industry. Write for it.

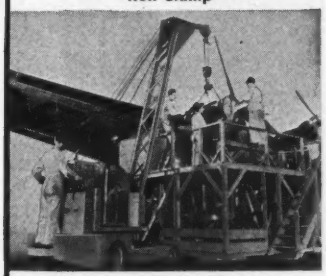
ELWELL-PARKER

POWER INDUSTRIAL TRUCKS

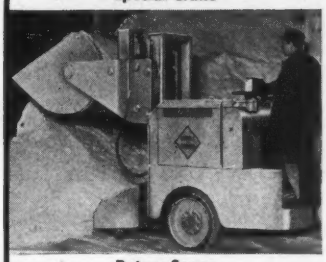
Established 1893



Roll Clamp



Special Crane



Rotary Scoop

Roll Handler with Apron

Drum Handler

Die Handler

MATERIAL HANDLING NEWS

IT'S NEW!

It's Different

It Tows Ten Tons!

The CLARKETTE-5

As light and tough as a bantamweight champion. Ideal towing tractor for order selection and similar warehouse operations requiring frequent starts and stops for loading and unloading small individual items.

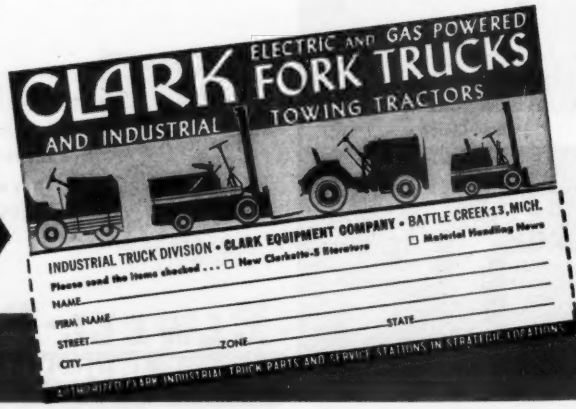
NOTE THESE REVOLUTIONARY FEATURES:

- Getting on and off is as easy as taking a normal step—because the driver stands.
- A rod extending across the machine above the cowl is a combination clutch and throttle control. This permits safe and easy operation whether driver is on the machine, or walking beside it—on either side—while it travels and tows.
- Tested, refined and proved in almost a year of actual use in order-selection work. Eminently practical, simple and economical.

Users will find it "a natural" for doing many daily chores now performed by less efficient and more expensive means.

- Complete facts and figures are presented in new literature which is yours for the asking.

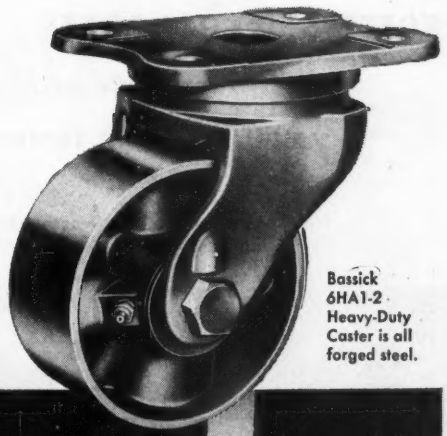
A good idea! MAIL THIS HANDY COUPON...TODAY



You can *Still* cut costs . . . through the

Reducible 30%

The *one* phase of manufacturing cost that remains really ripe for reduction, say cost analysts, is materials-handling . . . generally about 30% of total cost. The other 70%—wages, taxes, plant overhead—appears impregnable. Which means—look to materials-handling for cost savings . . . find your extra margin of profit in materials-handling's "Reducible 30%."



Bassick 6HA1-2 Heavy-Duty Caster is all forged steel.

Handling Retort Baskets on Bassick Heavy-Duty Casters at Beech-Nut Packing Company's plant in Canajoharie, N. Y.

How Bassick "6HA1-2" hits hard at the Reducible 30% . . .

Here's the nearest thing to indestructibility ever built in a 6 in. caster. If the load can be moved on a 6 in. caster, this Bassick HA Heavy-Duty Swivel Caster will do it—easily, safely and over a long service life.

This is only one of the many outstanding casters in the complete Bassick line. There are many special Bassick aids to materials-handling, such as . . . position locks, grooved-wheel casters for angle track, "FLOATING-HUB" casters, the new "Alcore" rubber-tread wheels, etc. . . . that cut your costs by saving production time and reducing maintenance on floors and "rolling stock."

For information on these products, write to THE BASSICK COMPANY, Bridgeport 2, Conn. Division of Stewart-Warner Corp. *In Canada:* Bassick Division, Stewart-Warner-Alemite Corp., Ltd., Belleville, Ont.

Bassick

Making more kinds of Casters . . . Making Casters do more

BOTTLES, BAGS, BOXES . . . MOTORS, MUSHROOMS, MAGAZINES

Whatever your product . . . however you package it . . . you'll handle it faster and cheaper with Rapistan

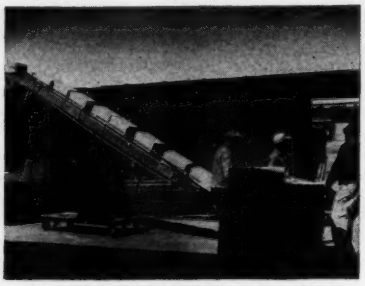
Whether you need a short-length gravity conveyor for fast truck loading, or a complete, multifloor power and gravity flow system . . . you'll find the right Rapistan equipment to meet your needs exactly!

GRAVITY CONVEYORS — Rapid-Wheel and Rapid-Roller, for low cost package movement.

STEVEDORE, JR. — Fast, easy loading, unloading, stacking. Gas model available.

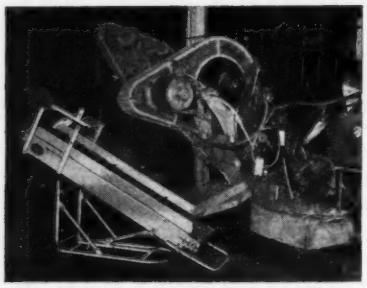
FLOOR-VEYOR, JR. — Floor to floor or horizontal movement of light products.

FLOOR-VEYOR — Floor to floor movement, heavy materials. Ideal for attic storage.



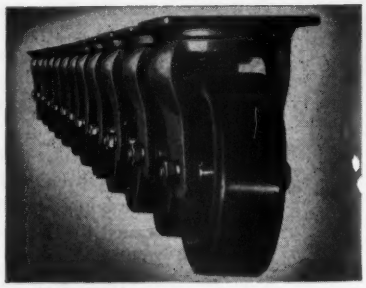
RAPID POWER BOOSTER — Heavy-duty loading, unloading; high, efficient stacking.

POWER-VEYOR — Fast, horizontal movement of all materials. Lengths to 150 ft.



PRESS-VEYOR — For stampings, small parts. Models also available for hot forgings.

HAND & PLATFORM TRUCKS — Sturdy, smooth-rolling. Long, continuous service.



RAPISTAN CASTERS — Steel-Forged and Flame-Hardened, or Cold-Forged.

Among people who know handling equipment, Rapistan ranks first. The reason? *Supreme dependability.* Rapistan products are designed to give trouble-free service long after most others have been replaced. For dependable uninterrupted flow of products — *through* packaging, storage and distribution — buy Rapistan! It's profitable.

All product names, "Rapistan", "Material Flow" — T. M.

RS

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MATERIAL *flow* EQUIPMENT

CONVEYORS: Power or Gravity, Portable or Stationary
CASTERS • PLATFORM TRUCKS • HAND TRUCKS

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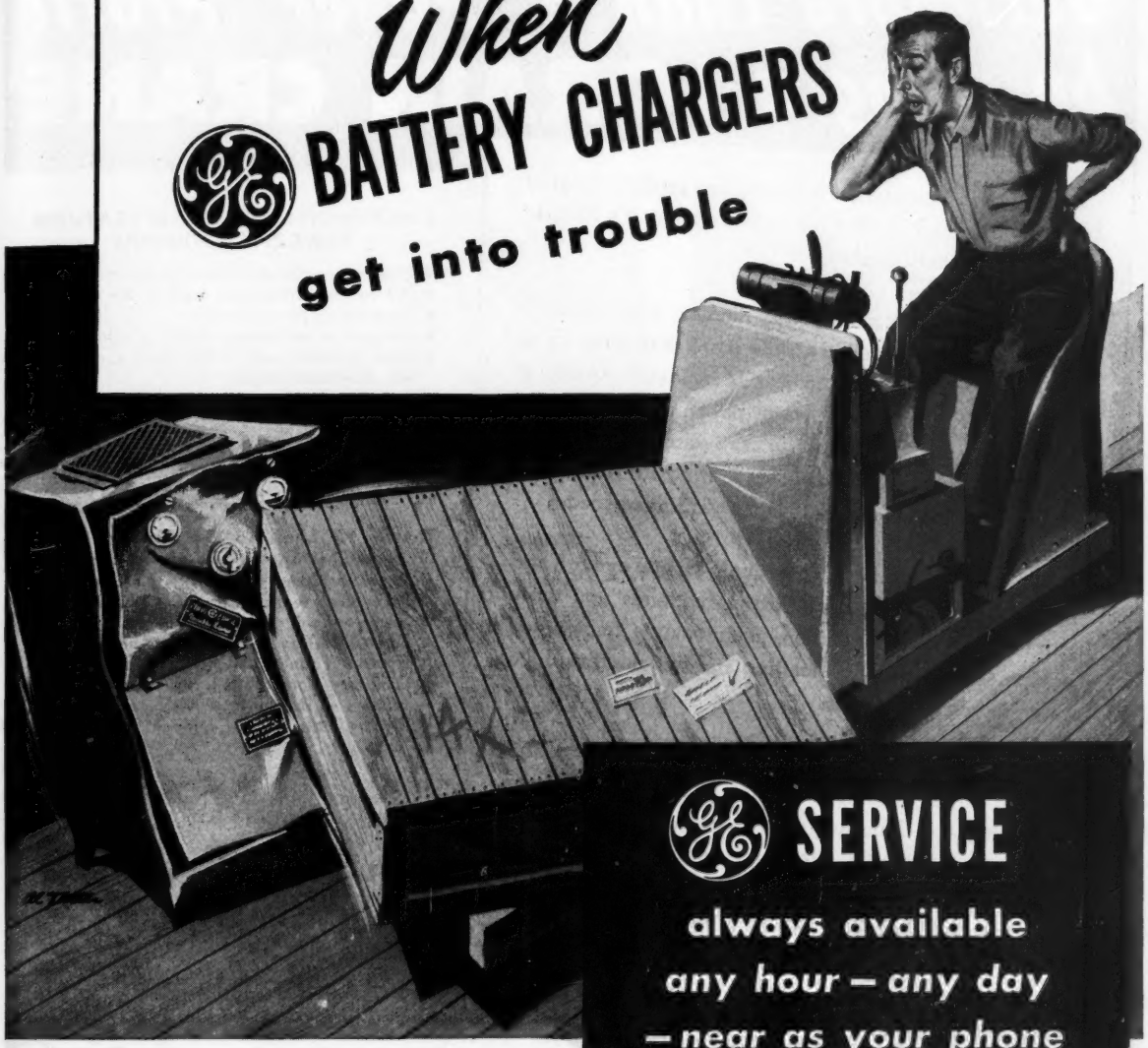

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always available
any hour — any day
— near as your phone

Accidents do happen. If anything happens to your G-E battery charger, 29 General Electric service shops are available—day and night, 365 days a year—for repairs, reconditioning or complete rebuilding—for work in the service shop or in your plant.

General Electric rectifier type battery chargers are tops—in basic design, materials, and construction. They provide a flexible, reliable charging system that keeps your trucks at work, and your costs low. Service—anywhere in the country, by factory trained personnel using genuine G-E parts—is one more good reason for insisting on G-E. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC

463-1

Get More than a "Paper" Profit by using a LORAIN CRANE

It's easy to show on paper how you can profit by buying new equipment, but after it's in your plant, it's straight performance that counts.

That's why Ohio Boxboard Co., Rittman, Ohio, feels its new Lorain Self-Propelled Crane more than lives up to its advance notice. Using a "Man-Saver" Grab, it handles 1500 lb. bales of waste paper with speed and accuracy — stacking higher to save yard space — conserving expensive manpower and using its rubber-tire mobility to hurry to any part of the yard as needed.

And this Lorain Crane is big enough, mobile enough and adaptable enough to give "extra dividends" on those extra jobs such as erection, maintenance, moving of equipment and supplies, loading and switching railroad cars, pulling trailers, etc.

Whether your material handling problem concerns moving paper or other material, a Lorain Crane can work for you — handling more materials faster, cheaper — increasing profits. We can't begin to tell you the whole story here. A 'phone call to your nearest Lorain distributor, or a request direct to us, will bring you full information.

THE THEW SHOVEL CO.
LORAIN, OHIO

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- One-man operation of turntable and carrier.
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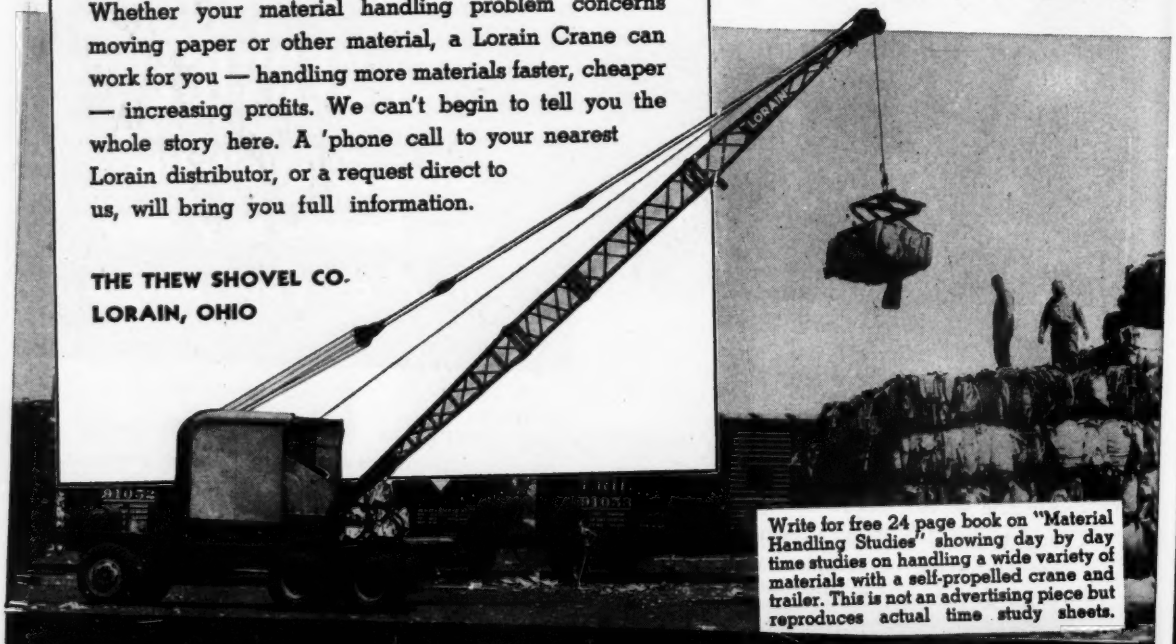
- Turnings • Punchings • Machinery • Stacks
- Drums • Cable Reels • Castings • Pig Iron • Ore



Write for free 24 page book on "Material Handling Studies" showing day by day time studies on handling a wide variety of materials with a self-propelled crane and trailer. This is not an advertising piece but reproduces actual time study sheets.

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Speeds Shipments Cuts Costs
FOR
LEADING TUBE FABRICATORS

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BRAINARD
STEEL COMPANY
2134 Larchmont Ave., Warren, Ohio

Steel Strapping Division, Brainard Steel Company
2134 Larchmont Avenue, Warren, Ohio

I would like to have Brainard specialists check our packaging and shipping set-up at no charge.

Name_____
Title_____
Company_____
Address_____
City_____ State_____

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LOCAL CHARGER SERVICE

FOR USERS AND
ELECTRIC TRUCK REPRESENTATIVES—

38 Service Repair Plants
7 Stock Locations
123 Sales Offices

ALL OVER THE MAP

. . . Yet at your door

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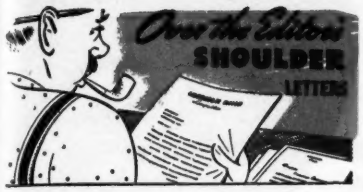
Rectox

Rectifiers & Chargers for ALL INDUSTRIES



To FLOW:

Standardization Of Packing

We are faced with a problem in reducing the cost of crating and skidding valves for shipment. . . We would like to attempt some sort of standardization of our packing practice. We would like to have you recommend to us a source of information on skidding and packaging practice from which we could obtain information, such as: (1) Maximum weights which may be shipped without skidding. (2) The most economical types of wood to use. (3) The most economical types of fasteners to use. (4) The minimum dimensions of skid timbers which can be used for any given valve weight and (5) Any other pertinent general information on this subject.—T. C. Jester, Metallurgist, Research Division, Engineering Dept., Darling Valve & Manufacturing Co., Williamsport, Pa.

The data given below in reply by C. D. Hudson are necessarily general in nature because information is lacking on the company's packing practices.—Ed.

With respect to the maximum weights (requested by Mr. Jester) which may be shipped without skidding, we would estimate these to be as follows:

Type of Container	Maximum
1—Wooden boxes	375 lb.
2—Unsheathed crates (Style A)	200 lb.
3—Unsheathed crates (Style C)	500 lb.

The most economical types of wood to use depend on the lumber market from time to time, but we believe that gum, poplar, eastern white pine, southern yellow pine and ponderosa pine would usually be the least costly.

The minimum dimensions of skid lumbers, which can be used for any given valve weight depends not only on the net weight of the valves, but also on the weight of the container as well. For such

means greater efficiency on

XTRA CUSHIONS

THANKS to a compound specially developed by Goodyear Research for Xtra Cushions, this solid Industrial Tire gives *far greater cushioning* and has less rolling resistance than conventional type tires.

Greatly increased cushioning assures you smoother riding and easier steering. Reduces driver fatigue and materials breakage, results in lower maintenance costs all around.

You'll find Goodyear makes the most complete line of industrial tires of all types and sizes—every one specially developed to fill a particular type of materials-handling need. So always SPECIFY Goodyear Industrial Tires on your new equipment—BUY your replacements from your local Goodyear dealer.

FREE TECHNICAL ENGINEERING ADVICE AND SERVICE

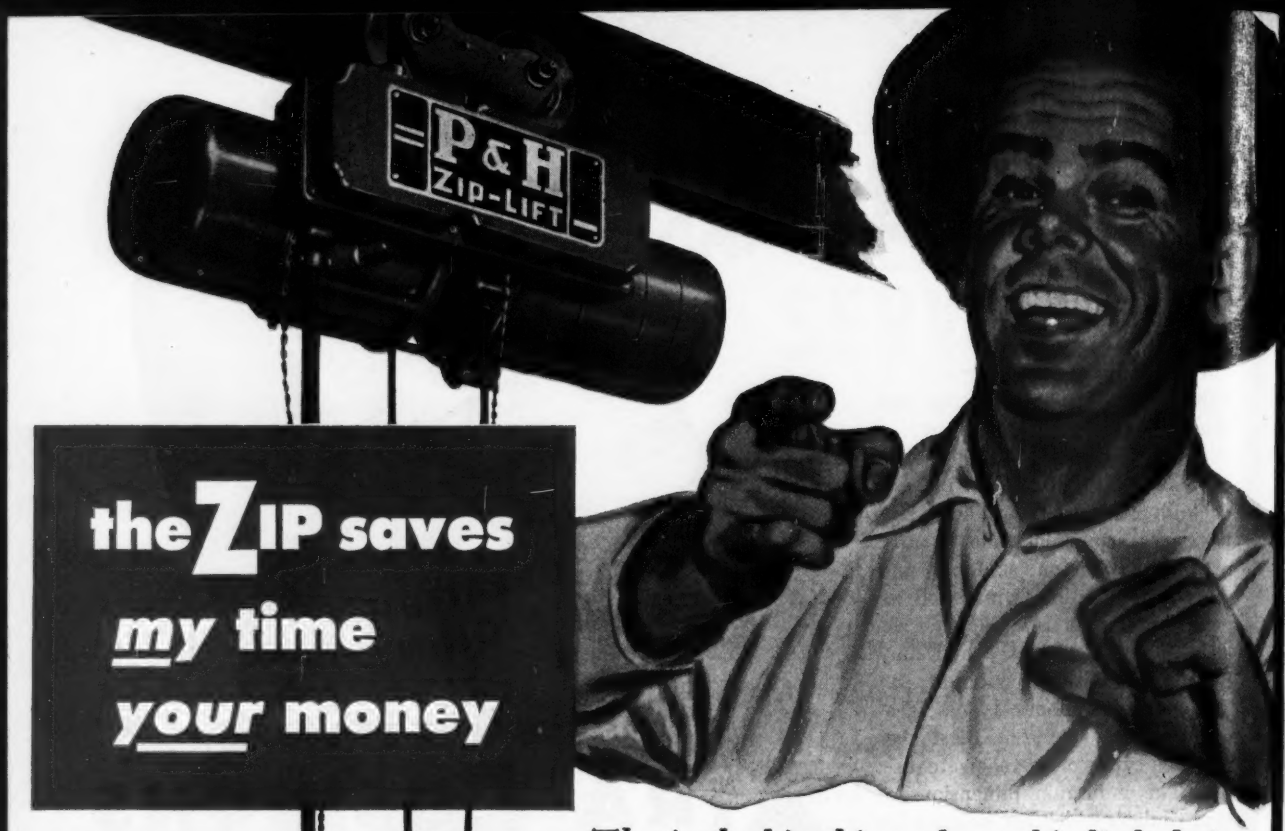
To help solve your particular industrial tire problems, Goodyear maintains a staff of fully-qualified technical experts. For their free recommendations, write: Industrial Tire Division, Goodyear, Akron 16, Ohio.

Xtra Cushion—T.M. The Goodyear Tire & Rubber Company

We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

GOODYEAR

INDUSTRIAL TIRES



the ZIP saves *my* time *your* money

That's the big thing about this little hoist!

Skilled workers should never be allowed to heave heavy loads by hand. Let them put their time and effort where they belong—in production.

In thousands of plants "thru-the-air" handling with the Zip-Lift is saving time—earning money... beside machine tools, along assembly lines, around loading docks, receiving rooms, warehouses—wherever the handling of loads up to 2,000 pounds can be turned into a push button job.

What are your chances for making money with the Zip-Lift? Any P&H Representative will show you where—and how—and how much profit it will earn for you.

Meanwhile, bulletin H20-4 may help you. It's filled with money-saving ideas. Write for it. Use the coupon below.

P&H ZIP-LIFT

Handle it "thru-the-air" at lower cost

These added values make the P&H Zip-Lift

America's most popular little wire rope electric hoist

SAFER — 110 volt push-button control. No open wiring. Plugging type limit switch; double brakes.

LIFETIME CONSTRUCTION — Precision built — shaved gears running in oil — grease-sealed antifriction bearings — fully enclosed, moisture-proof, dust-proof, acid-proof. Motor designed for hoist service.

ALERT SERVICE — Out-of-stock delivery from qualified dealers everywhere — also backed by 19 branch offices and conveniently located warehouses.

And Now . . . Still More New Features — All Standard Equipment

- Lower limit stop — meets all safety codes.
- Extra ground conductor in feeder cable and push button pendant.
- Reinforced push-button pendant.
- Grooved drum for longer cable life.

Available in capacities up to 2000 lbs.

P&H ELECTRIC HOISTS
4643 W. National Ave.
Milwaukee 14, Wis.

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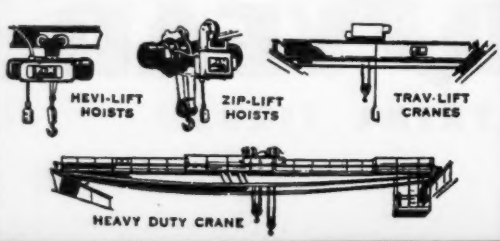
MOTORS • OVERHEAD CRANES • HOISTS • ARC WELDERS and ELECTRODES • SOIL STABILIZER • CRAWLER and TRUCK CRANES • DIESEL ENGINES • CANE LOADERS • PRE-ASSEMBLED HOMES



HARNISCHFEGER CORPORATION
4643 W. National Ave., Milwaukee 14, Wis.

Gentlemen: Please send me your Bulletin H20-4 on the Zip-Lift.

Name.....

Company.....

Address.....

City.....**Zone**.....**State**.....

determination, gross weights are always employed, and their limits are generally as follows:

1 - 500 to 2,000 lbs. incl. . . . 2" or 3" nominal skid.

2 - 3,000 to 4,000 lbs. incl. . . . 3" or 4" nominal skid.—C. D. Hudson, Manager, National Wooden Box Association, Washington 6, D.C.

To FLOW:

Department Store Operation

Will you please send us two copies of your November issue in which there is an article about handling dresses on a monorail. We find this an interesting application. —F. Rowe, J. H. Ryder Machinery Co., Toronto 5, Ontario, Canada.

To FLOW:

Core Makers Should Be At Benches

Will you kindly send us your issue of December 1947, or if not available, a reprint of your article on page 16, entitled "How To Keep Core Makers At Their Benches".—

To FLOW:

Filter Type Muffler

I have recently heard that a muffler has been developed which filters carbon monoxide and other exhaust gases. Do you have any information on such a muffler and whom can I contact for descriptive literature and prices?—F. W. Thornhill, Staff Assistant, Public Service Co. of Northern Illinois, Chicago 3, Ill.

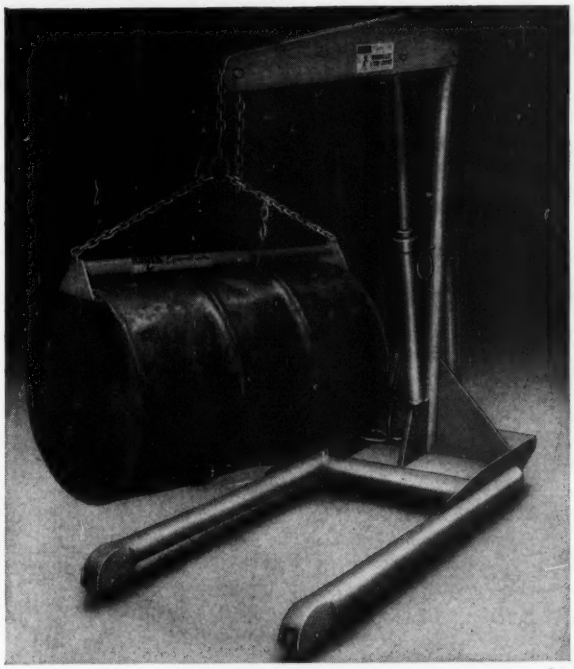
According to latest information available, such a muffler, repeatedly refined in recent years, is still in the development stage. At present it is said to be under test.—Ed.

To FLOW:

Space-Saving Shippers

Our firm manufactures paper tubes for the textile industry. The usual weight of our shipping containers are about 300 pounds. Please send us a list of manufacturers of Collapsible-Returnable

(Turn to page 18)



For shipping and receiving, material storage, loading and unloading cars and trucks, etc. Capacities to 6000 lbs.

Try this **RUGER Hydraulic Floor Crane** for Ten Days Free

Fill out the coupon below. Mail it to us attached to your letterhead. We'll contact our distributor in your territory and arrange with him to furnish you a genuine Ruger Hydraulic Floor Crane for a *ten day free trial* in your own plant.

There are no strings attached . . . no obligation to buy. If, at the end of the ten-day free trial, you believe that you can get along without the Ruger, it will be removed at no cost to you.

Remember, this is the genuine Ruger, the original Hydraulic Floor Crane that eliminates back-breaking heavy lifting and saves time and money in thousands of plants from coast to coast. Perhaps you may have wondered whether the Ruger could do as much for you. Here is your chance to find out without spending any money or obligating yourself in any way.

Mail coupon today as we must reserve the right to withdraw this free trial offer at any time and without prior notice.

Attach this coupon to your letterhead

Please arrange for us a ten-day free trial of a Ruger Hydraulic Floor Crane. We understand that this request does not obligate us in any way.

Your Name_____

Company_____

Street Address_____

City_____ Zone____ State____

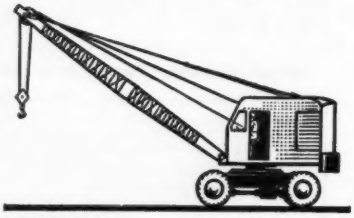
RUGER Equipment Co., Inc.

Load Lifting and Handling Devices

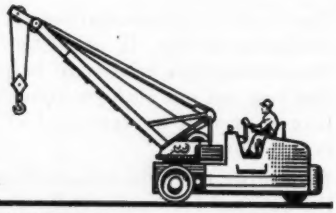
601 West Fourth Street • Uhrichsville, Ohio

SEND FOR THIS FREE BOOK--

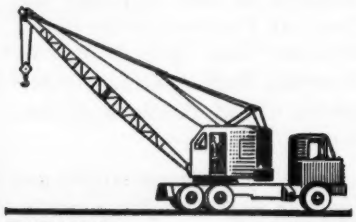
Sixteen pages of helpful, interesting information on handling, stockpiling, loading and unloading a wide variety of materials quickly, safely, efficiently.



UTILITY CRANES . . . . . Pages 4 - 5 - 6 - 7



CARGOCRANES . . . . . Pages 8 - 9



TRUCKCRANES . . . . . Pages 12 - 13

The Link-Belt Speeder line of crawler and wheel mounted shovel-cranes will serve you most efficiently in handling your materials. Write for this free book — and ask the nearby Link-Belt Speeder distributor to show you the line. To modernize . . . *mechanize!*

Link-Belt Speeder Corporation
Cedar Rapids, Iowa

Send me Book No. 2503 on Industrial Applications for Link-Belt Speeder Shovel-Cranes

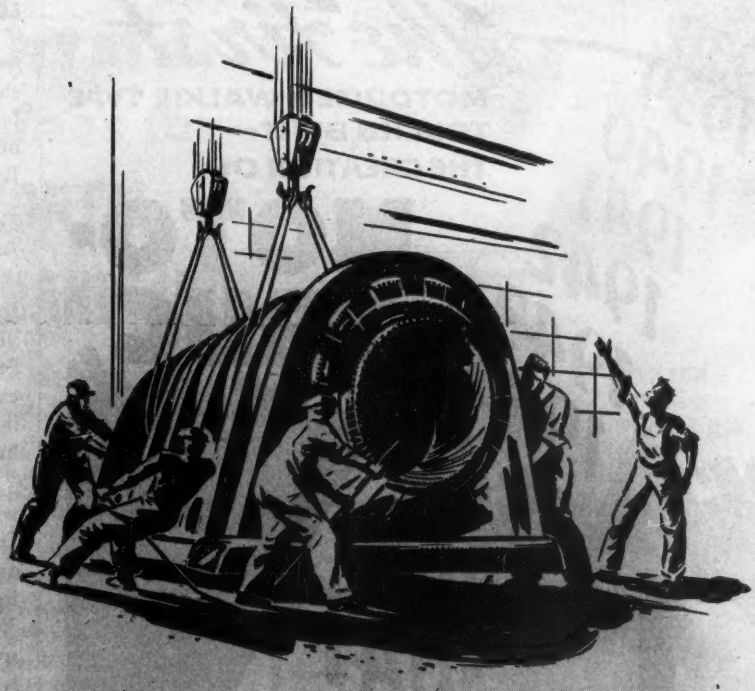
Name

Company

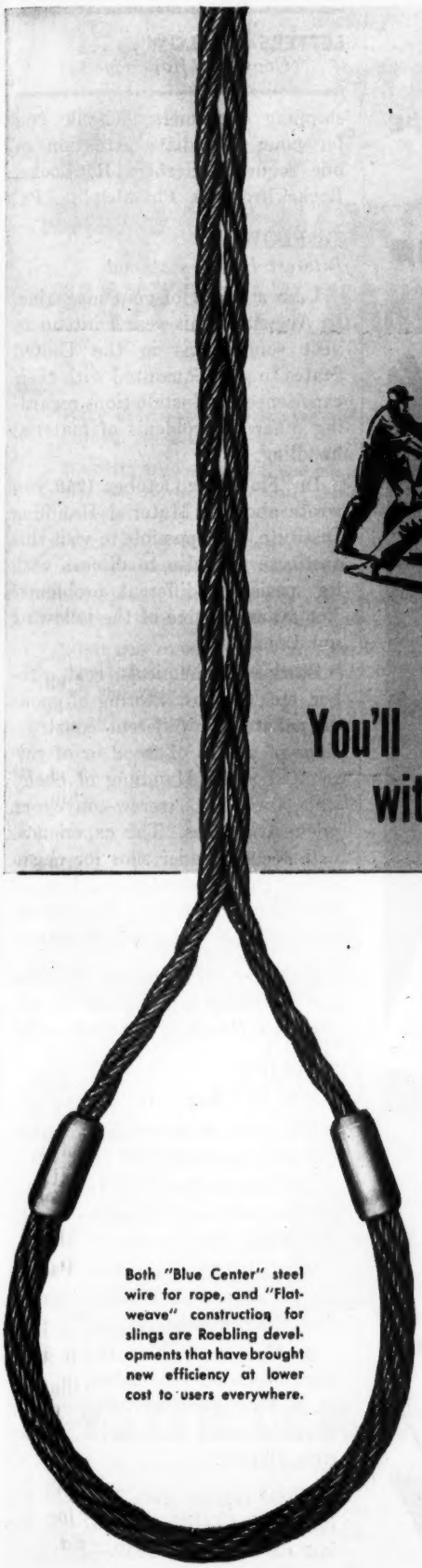
Street Number

City and State

11,743



You'll lift loads faster—cheaper—with Roebling "Flatweave" Slings



Both "Blue Center" steel wire for rope, and "Flatweave" construction for slings are Roebling developments that have brought new efficiency at lower cost to users everywhere.

YOU'LL SAVE TIME and you'll save money with Roebling "Flatweave" Slings. In the first place, they last longer. Six individual wire ropes—of Roebling's famous "Blue Center" steel wire—are woven together side by side in "Flatweave" Slings. This forms a broad, flat bearing surface which distributes the load pressure and prolongs the life of the sling.

In the next place, "Flatweave" Slings are easier and faster to handle. They are very flexible and kink resistant. You can pass them through and under loads of minimum clearance. And besides that, they are free of unnecessary fittings. Heavy thimbles and servings are not needed with the specially-reinforced loops of "Flatweave" Slings.

Write today for a copy of the "Roebling Sling Data Book". It's free . . . gives timely information about slings and sling accessories. For lifting loads with top speed, safety and economy . . .

Today it's Roebling!

JOHN A. ROEBLING'S SONS COMPANY, TRENTON 2, N. J.

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Atlanta, 934 Avon Ave. ★ *Boston,* 51 Sleeper St. ★ *Chicago,* 5525 W. Roosevelt Road ★ *Cincinnati,* 3253 Fredonia Ave. ★ *Cleveland,* 701 St. Clair Ave., N. E. ★ *Denver,* 4801 Jackson St. ★ *Houston,* 6216 Navigation Blvd. *Los Angeles,* 216 S. Alameda St. ★ *New York,* 19 Rector St. ★ *Philadelphia,* 12 S. Twelfth St. ★ *Portland,* 1932 N. W. 14th Ave. ★ *San Francisco,* 1740 Seventeenth St. ★ *Seattle,* 900 First Ave. S.

● MOTO-TRUCS ARE UP TO 15" SHORTER, DUE TO COMPACT POWER UNIT; HAVE ALL CONTROLS IN ROLLER TYPE HANDLE, LOW POWER COST AND OUTSTANDING SAFETY FEATURES. *Write for literature.*

PALLET, PLATFORM AND HI-LIFT TRUCKS

The MOTO-TRUC Co.
1953 E. 59th Street
CLEVELAND 3, OHIO.
ORIGINATORS OF MOTORIZED HAND TRUCKS

LETTERS TO FLOW . . .
(Continued from page 14)

shipping containers. Thank you for your immediate attention to our request.—Herbert R. Locke, Locke Brothers, Philadelphia, Pa.

To FLOW:
Interest Is International

I am a reader of your magazine. In August of this year I intend to visit some firms in the United States to get acquainted with their experience and installations regarding different problems of material handling.

In "Flow" for October 1949 you wrote about a Material Handling Institute. Is it possible to visit this Institute and also to discuss with its specialists different problems? For example some of the following questions:

Storing of chemicals, coal, rubber, etc., in silos. Storing of goods on pallets, the different constructions of pallets of wood or of corrugated steel. Handling of chemicals with belts, screw-conveyors, pneumatic-tubes. The experiences with feeders under silos for chemicals. The automatic weighing of chemicals.—Valentin Wiesemann, Hannover, British Zone, Germany.

Engineer Wiesemann received the necessary information on the Material Handling Institute.—Ed.

To FLOW:
It's In The Bag

Will you please send to us the following papers:

1—Cement-Handling from bagging to outbound vehicles—It's In The Bag. July, p. 62.

2—Pallet Program For Materials In Bags And Drums. Part 1. December, p. 32.

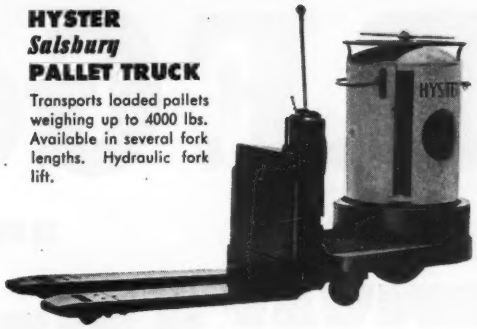
3—How to Unitize Paper Bags For Shipment. November, p. 30.—D. S. Frey, Secretary, Textile Bag Manufacturers Association, Evanston, Illinois.

These reports were listed in the index of FLOW articles for the last six months of 1949.—Ed.

4 New HYSTER machines for HORIZONTAL MATERIALS HANDLING

HYSTER *Salsbury* PALLET TRUCK

Transports loaded pallets weighing up to 4000 lbs. Available in several fork lengths. Hydraulic fork lift.



HYSTER *Salsbury* PLATFORM TRUCK

Handles loads of 4000 pounds on skids or tote boxes. Available in several lengths and widths. Hydraulic platform lift.

- ✓ **FULLY AUTOMATIC CLUTCH AND TRANSMISSION. No gear shifting. No levers.**
- ✓ **THROTTLE RING — press it and the truck moves. The further you depress it the faster the truck goes. No gear shifting.**
- ✓ **TRUCK TURNS IN ITS OWN LENGTH. Entire Turret power unit can be completely rotated in either direction.**
- ✓ **ECONOMICAL. Uses less than one gallon of gasoline per average 8-hour shift. Wisconsin 6-HP air-cooled engine.**
- ✓ **COSTS LESS TO BUY THAN MOST POWER-DRIVEN "WALKER CONTROLLED" HAND PALLET OR PLATFORM TRANSPORTING TRUCKS.**
- ✓ **AVAILABLE IN VARIOUS SIZES.**

HYSTER *Salsbury* TUG

Tows trailer trains up to 15,000 lbs. Most maneuverable towing unit on the market.

HYSTER *Salsbury* CARGO TRUCK

Capacity 4000 lbs. Low platform makes bulky or heavy cargo handling easy.

HYSTER *Salsbury* Turret Trucks

FOR HORIZONTAL MATERIALS HANDLING

HYSTER *Salsbury* Turret Trucks are LOW COST HORIZONTAL TRANSPORTERS for any type of load up to 4000 pounds. They do the same jobs faster, safer, more economically than man-pulled or power-driven hand pallet or platform trucks of the "walker controlled" type. They team up ideally with all other materials handling systems or machines.

Hundreds of Turret Trucks are in use. They are low in first cost, low in operating cost, high in job performance, are extremely simple to operate.

HYSTER *Salsbury* Turret Trucks are sold—and more important — serviced by Hyster dealers all over the world. Ask for a demonstration. Or mail the coupon for a copy of the Turret Truck catalog, just off the press.

HYSTER® COMPANY

Manufacturer of a complete line . . . HYSTER fork-type Lift Trucks, Straddle Trucks and Karry Kranes — 2,000 lb. to 30,000 lb. capacity; HYSTER Salsbury Turret Trucks — 4,000 lb. capacity.

HYSTER CO., 2931 N. E. Clackamas Street, Portland 8, Oregon
Please AIR MAIL copy of the new HYSTER *Salsbury* Turret Truck catalog.

FIRM NAME _____

MY NAME _____

ADDRESS _____

CITY _____ ZONE ____ STATE _____

B.F.Goodrich

announces

TIRE AND WHEEL TW ANALYSIS PLAN

for materials handling

HOW IT WORKS

An experienced tire and wheel man will survey your operation. He will study loads, hauls, handling equipment, floors and hauling surfaces, and discuss any special tire and wheel problems you may have. On completion of this survey the BFG man, without charge or obligation on your part, will submit recommendations as to the best type and size tires and wheels for your particular service with information on the longest-wearing compounds and on retreading. He will also provide suggestions on tire care and maintenance.

HOW YOU SAVE

Tire and wheel costs can be cut as much as 50% through the application of the right type, size and tread compound, to the job. Additional savings are made through protection of floors, equipment and cargo. (Previous studies show improvements can be made in two out of three operations.)

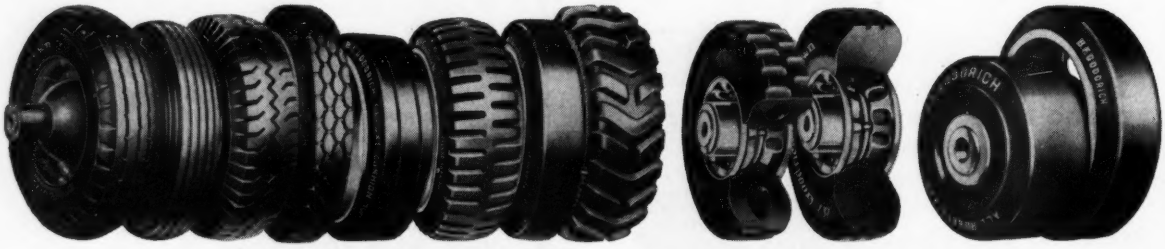
Proper tire maintenance alone can cut tire and wheel costs 10% to 20%.

WHY YOU GET IMPARTIAL RECOMMENDATIONS

No other company offers as wide a range of types, sizes, and tread compounds as B. F. Goodrich. There is no selfish reason for a B. F. Goodrich man to push any one type of tire against another. He has them *all.* His advice is impartial.

14 TYPES OF TIRES—6 DIFFERENT TREAD COMPOUNDS

B. F. Goodrich offers a complete line of tires for materials handling equipment—pneumatics, puncture-sealing inner tubes, solids including pressed-on and vulcanized-on types, zero pressure types (semi-pneumatics). There's a wide choice of tread designs in each type and 6 different tread compounds for 6 different purposes in the solid tires. Only B. F. Goodrich has this complete line of types, compounds and sizes. *Today—mail the coupon for information on this new* and practical Tire and Wheel Analysis plan. A similar program is available for manufacturers of materials handling equipment.



The B. F. Goodrich Co.
Department TW-28
Akron, Ohio

Please give me additional information on your Tire and Wheel Analysis plan.

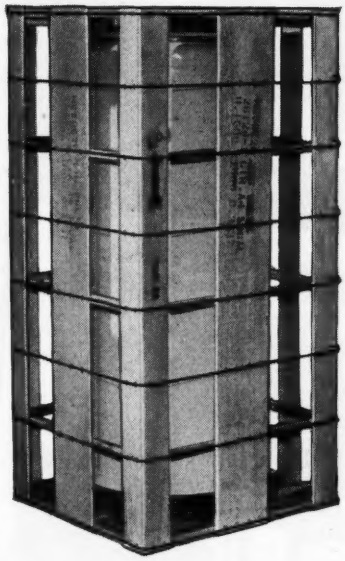
Name_____

Title_____

Company_____

City_____ State_____

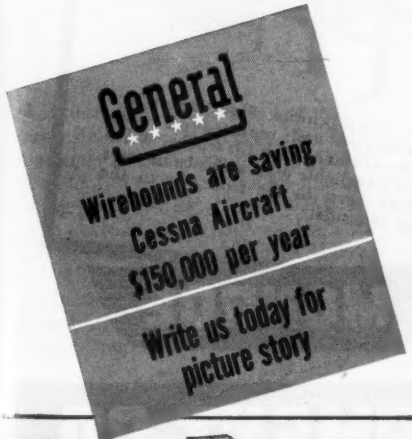
General Boxes...



for WATER HEATERS or WRENCHES

or hundreds of other products

General boxes protect the product . . . cut down loss and dissatisfaction. They are lightweight yet extra strong! They are easily and quickly assembled, providing "the best of protection" for hundreds of American products. We will be glad to help design a more economical, a more efficient container for your product. Write us today for complete information.



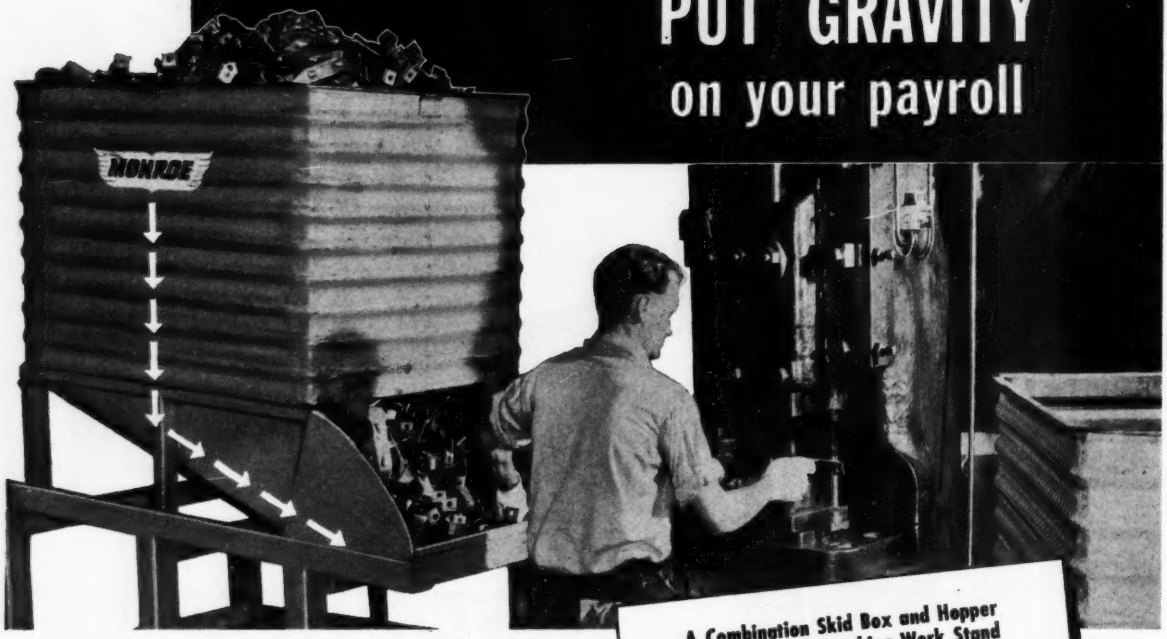
General BOX COMPANY

engineered shipping containers

GENERAL OFFICES:
60 W. Illinois St. Chicago 10, Ill.

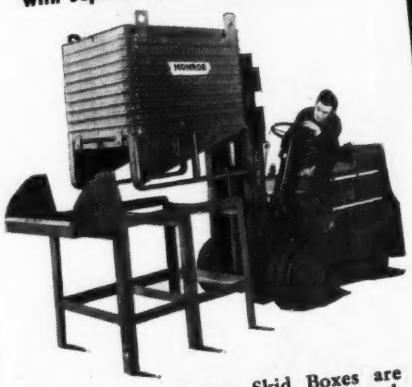
DISTRICT OFFICES AND PLANTS: Brooklyn, Cincinnati, Detroit, East St. Louis, Kansas City, Louisville, Milwaukee, Meridian, Sheboygan, Winchendon.
Continental Box Company, Inc.: Houston, Dallas.

MONROE DROP-BOTTOM SKID BOXES PUT GRAVITY on your payroll



- *Exclusive* Monroe Drop-Bottom Skid Boxes cut labor and handling costs as much as 20%. Hand lever releases hinged bottom of box, sliding stampings, castings and other small parts into waist-high tray of matching work stand.
- By keeping parts in convenient work position, Drop-Bottom Boxes eliminate stooping, bending and reaching—speed production operations.
- Monroe Drop-Bottom Skid Boxes available in 6 different sizes and weights with separate work stands for each. Rugged steel construction.

A Combination Skid Box and Hopper with Separate Matching Work Stand



Monroe Drop-Bottom Skid Boxes are easily removed and replaced on work stands by ordinary high lift trucks. Work stands are available with a choice of trays to deliver parts to the front, or to the right or left side.

MONROE 8-WAY STEEL PALLET streamlines handling and shipping. Permits entry of fork truck from 8 different directions, pallet truck from 4 different directions. Nine hollow anchoring posts facilitate solid tiering.

Write for literature on Monroe's complete Material Handling Equipment line, including: Drop-Bottom Skid Boxes; 8-Way and 2-Way Steel Pallets; collapsible wire and standard skid boxes; standard platforms, skids and nestling rings, and various accessories.

MONROE®

MONROE AUTO EQUIPMENT CO.

Monroe, Mich. – World's Largest Maker Of Ride Control Products

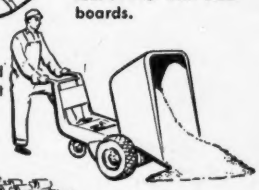
A 15-minute demonstration will show you how to

SAVE UP TO 20 MAN-HOURS A DAY

The BELL Prime Mover*

You can make these savings with the BELL Prime Mover . . . a new conception in materials handling, plant-maintenance equipment, and all around utility . . . a machine that combines the functions of a giant self-propelled wheelbarrow, a half-ton platform truck, and a powerful snow plow or scraper.

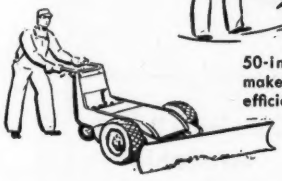
Bucket holds 10 cubic feet . . . 18 with sideboards.



Mechanically dumped . . . operates by foot pedal.

9-square-foot steel platform takes half-ton loads.

Climbs 20% grades fully loaded.



50-inch steel blade makes Prime Mover an efficient snow plow.

FEATURES:

- gear driven . . . no belts or chains
- fully enclosed engine protected against dirt and moisture
- clutch, engine, transmission all run in oil
- switch from bucket to platform without tools . . . in less than a minute
- turns in its own length (63½"); width 31½"
- 3-gallon tankful of fuel gives 8 hours continuous service

A product of THE PRIME-MOVER CO., Muscatine, Ia.

*PATENTS & T. M. REG. PENDING. COPYRIGHT, 1949

● Hundreds of plants now use one or more Bell Prime Movers to haul bulk materials to and from processing stations and to relieve workmen of heavy lifting and pushing. These plants report savings in payroll as high as $36.00 a day for each Prime Mover.

Not only do Prime Movers speed production and cut costs, they also contribute to morale. For example, a tannery purchased its Prime Mover simply to make a disagreeable and heavy job easier for workmen. Another plant bought a machine so as to utilize the services of an elderly worker no longer able to do heavy labor.

Wherever wheelbarrows or hand trucks are used in your plant, the Prime Mover should be carefully considered. Not only will it perform this work better and at lower cost, but it can be shifted to other duties . . . plowing snow, grading driveways, hauling construction materials or maintenance equipment. Its versatility and usefulness in and about a plant are virtually unlimited . . . but see this for yourself at a demonstration.

Simply sign the coupon and clip it to your letterhead. We'll put you in touch with a nearby distributor . . . a member of our nationwide sales and service organization.

SEND COUPON NOW!

THE PRIME-MOVER CO., MUSCATINE, IOWA

Please send me facts on the Bell Prime Mover. Who is the nearest distributor?

Name_____ Company_____

Address_____ City, Zone & State_____

20%

ADDITIONAL K.W.H. CAPACITY

C & D FIVE-FOLD *Slyver-Clad*
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A Job Foundry's Method For { Sand / Flasks / Rubbish

By H. G. STELLWAGEN
General Manager
The Hetzler Foundries, Inc.
Rochester, N. Y.

IN a job foundry such as ours a part of the daily work requirements consists of transporting a considerable tonnage of operating supplies, such as molding sand, core sand and flasks in intermittent moves. A good deal of effort and production time can be wasted when the handling of these materials remains overlooked. Unplanned methods for operating supplies can also create unsatisfactory working conditions because of excessive demands made on human effort in the performance of various jobs.

Three Factors For Efficiency

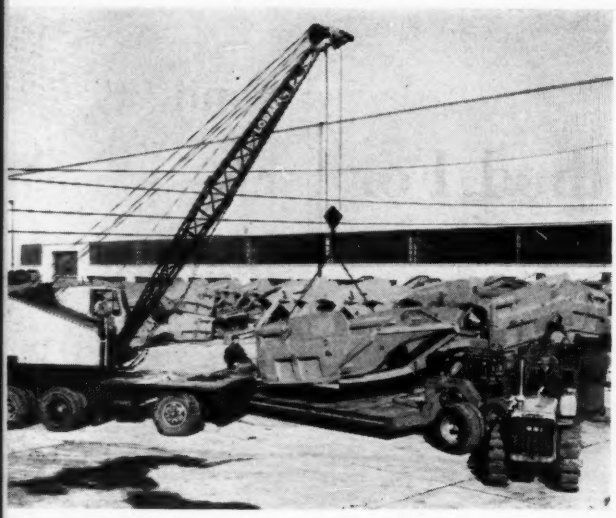
The movement of tons of molding and core sand across a yard could be a job in this category. Since about two years ago our company has employed a powered barrow for this purpose. The barrow, with controls on the handles, has the center of gravity on the front end of the scoop. When it is tripped, it is self-unloading, thus eliminating the need for shoveling. And since it is powered for travel, it saves the exertion that would be necessary in pushing loads, espec-

(Turn to page 56)

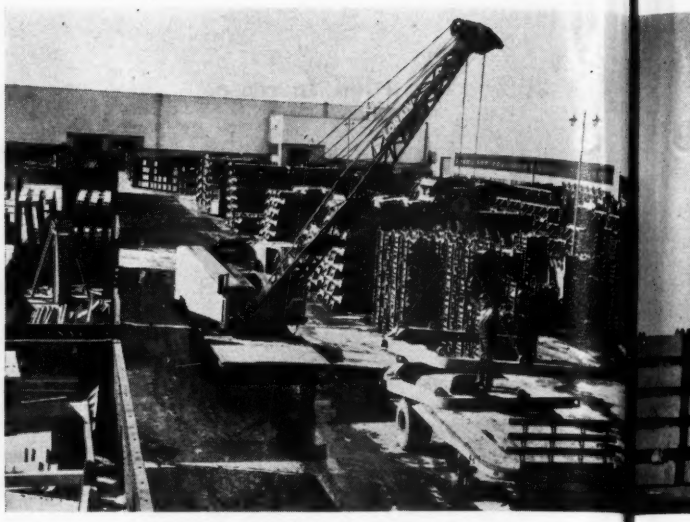
TOP—THE PAYLOAD rolls across the yard without pushing.

CENTER—SELF-UNLOADING FEATURE reduces shoveling labor.

BOTTOM—PLATFORM CAPACITY made this a part-time operation.



YARD CRANE places scraper bowl on low-bed trailer for movement to assembly. It also . . .



UNLOADS GONDOLAS. These are "C" frames for tractors. The machine's long boom is . . .

YARD HANDLING . . . . FOR ASSEMBLY LINE FU

By W. NAUMANN

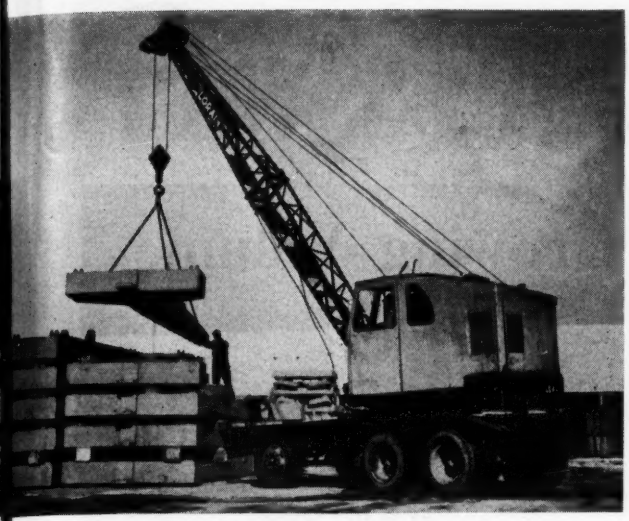
Production Manager
Caterpillar Tractor Co., Peoria, Ill.

AN example of diversified outside handling is afforded in the six-acre yard operated in conjunction with a new 800,000 sq. ft. plant in which steel fabricating operations and assembling of earthmoving equipment are performed. The weight of many of the individual metal components ranges from 4000 lb. to 10,000 lb. The heavier parts are handled by a pneumatic tired crane of 15,000 lb. capacity, the lighter ones by a crane truck of 10,000 lb. capacity. This photo report pictures typical handling tasks of these machines performed in a variety of operations. The equipment is worked 16 hours (two shifts) per day.

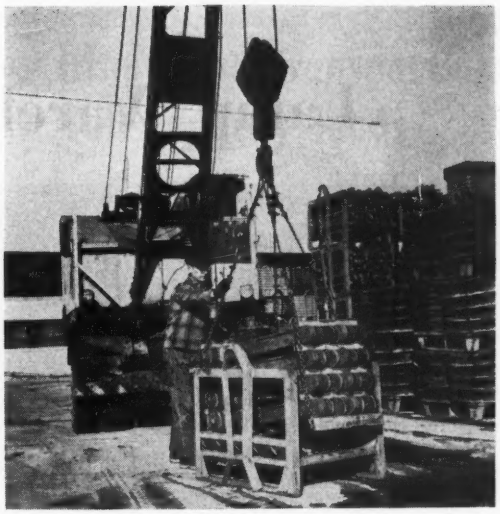
Among regular operations belong the unloading of railroad cars and highway trucks, building stockpiles, unstacking parts and loading trailers to fill orders for assembly. Certain types of bundled components are loaded into stacking racks for fork truck handling. The crane truck also delivers some of the bulky components direct to the assembly line.

The stacks in the yard are laid out so that the self-propelled crane and the crane truck can perform their duties with minimum travel. While the crane can operate in 20-ft. aisles, the latter were made 30 ft. wide for a fast-moving operation and as an added safety factor. The wider aisles facilitate maneuvering around corners. The 30-ft. boom of the crane is useful in unloading gondola cars and building high stacks. This machine is also used periodically in the steel storeroom for unloading bundled steel plate from gondola cars, thus relieving the busy bridge crane.

We believe that the efficiency of in-plant handling must be matched by equally well-planned methods in the yard.



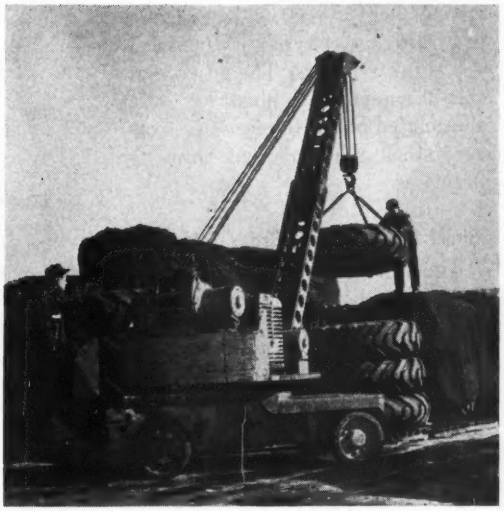
USEFUL IN high stacking of heavy components like these. Another task consists of . . .



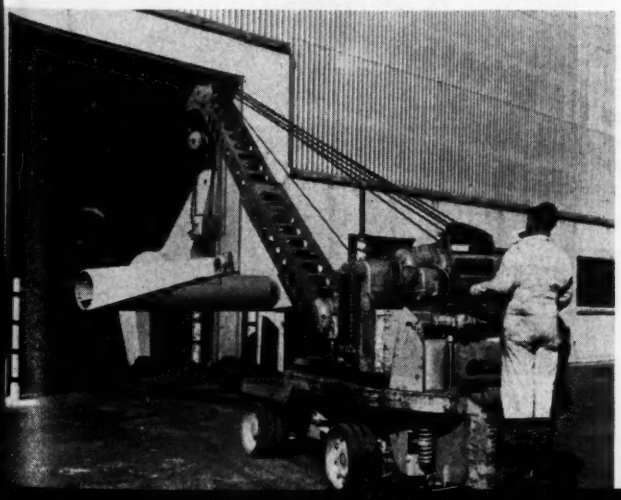
UNLOADING BUNDLED parts directly into stacking frames. The crane is teamed up . . .

NE FUNCTION

WITH A CRANE TRUCK, shown here, which handles lighter parts. In the next photo . . .



CRANE TRUCK is delivering a draft beam to the assembly line. Pneumatic-tired crane . . .

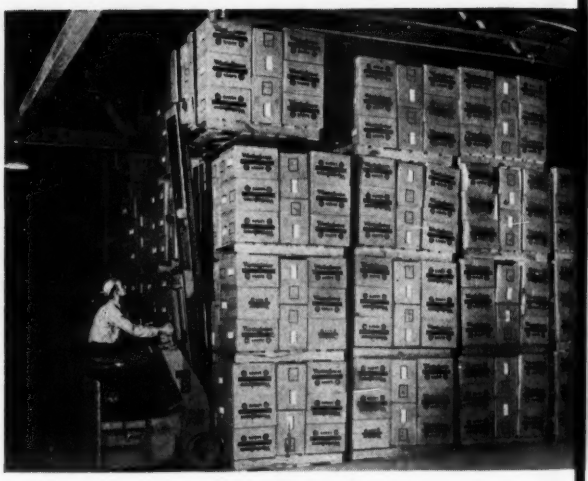


ALSO WORKS in shop. Here it is unloading bundled steel in the steel storeroom.

Lamp Warehousing . . . for Growing Volume

By E. H. FRANK
Methods Manager, Westinghouse Lamp Division, Chicago

THE material handling methods in a warehouse for electric lamps have a good deal in common with those of other manufacturers' warehouses which serve as central distribution points. Among these considerations belong the avoidance of excess man-travel, utilization of the cube, economical use of material handling equipment, efficient stock arrangement in relation to (a) rate of turnover, (b) types of items and (c) types of orders. The purpose of this discussion is to illustrate these and related points to receiving, storage, stock selection and shipping practices.



COMPACT 1000-lb. cap. trucks like this unload and load cars, tier, assemble "bulk" orders of lamps.

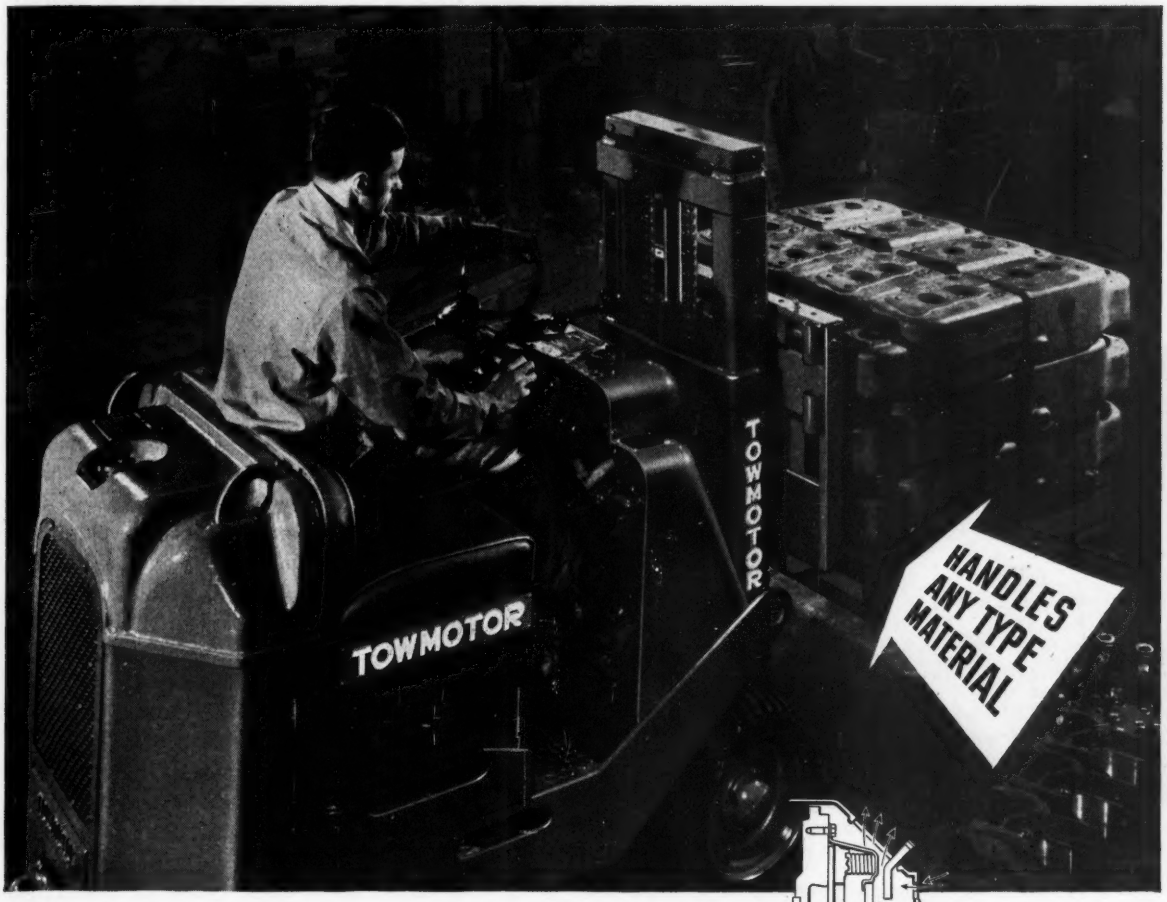
PALLET RACKS for miscellaneous items. These small orders are assembled by walkie truck.

Short Hauls, Quick Order Selection

The Chicago lamp warehouse of the Westinghouse Electric Corporation was enlarged early in 1948 to a size approximately 113′ x 700′, or just under 80,000 sq. ft. At that time we adopted the pallet-fork-truck method; some gravity conveyors for certain functions are also employed. The expansion and methods improvement program were designed for efficient handling of the company's growing volume of lamp business. Millions of electric lamps are handled regularly in this warehouse, which ships throughout the midwestern states and as far west as Omaha.

Such building features as freight car doors and truck doors were located in relation to material flow—that is, for short travel distances which in turn would result in short order selection time. Six car doors are centrally located in relation to the length of the building at the east side; and six truck doors are located similarly on the west side of

Power Plus– for lifting and transporting full capacity loads



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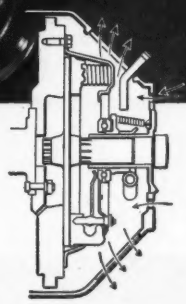

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the plant. Thus many items constituting truck shipments need only be transported across the 113 ft. width of the building; the stacks for carload shipments are conveniently close on the "rail" side of the building.

"Walkies" Coordinated With Riding Type Trucks

Following is a detailed description of the procedures. At the outset, however, it must be understood that the general category "electric lamps" includes dozens of varieties and special types for domestic, commercial and industrial uses. Hence planned stock arrangement is as important here as in a general merchandise warehouse.

The lamps arrive in carload lots, and the bulk of the orders is likewise shipped by rail. The cases of lamps are palletized at the receiving point. Double face 48" x 48" hardwood pallets were adopted as most efficient for accommodating the variously sized cases. The boards on the bottom decks are spaced to allow for movement by motorized hand pallet truck — a type of vehicle which figures importantly in our operation along with riding type fork lift trucks.

Two fork lift trucks of 1000 lb. capacity with telescopic lifts are adequate for all tiering and detiering purposes. While the heaviest loads will approach 1000 lb., the average is closer to 600 lb. Wherever possible, the hand-guided vehicles are coordinated with the lift trucks for economical operation.

The fork lift trucks are generally used for unloading and loading freight cars. Incoming cars are spotted at the doors nearest to the stacks where the arriving lamps will be stored. This means that warehousing functions are accomplished with short runs. The contents labels are attached to the cases so that they face "out", which avoids manipulation of individual units after they have been put in stock. If, during unloading, the fork lift trucks are momentarily busy with other tasks, a motorized hand pallet truck will be assigned to the job of moving the pallet loads from the car into the main aisle. Stacking can then proceed later, without interfering with current operations. The partial interchangeability of these two types of equipment makes for efficiency in handling the inbound and outbound volume.

The matter of adequate aisles is always important. Two main aisles 11′ 6″ wide run the full length of the warehouse; these together with twelve 10′ cross aisles give access to all stacks in the old and new sections of the building.

FAST - MOVING ITEMS for truck lines, also assembled by walkie, are kept in compact space.

STEEL SHELVING serves for efficient arrangement of less-than-case stock. Note neatness.

Stock Groupings. Order Selection

The stacks of lamps are arranged according to wattage. The bulk of the merchandise, ranging from six to 1500 watts, is concentrated in the newly added warehouse section. This arrangement makes for easy order selection and inventory con-

DOW CHEMICAL saves thousands of dollars annually with *BAKER TRUCKS*

Baker Fork Truck with Trayner-Reinhart cylinder carrier easily transports twelve 16" cylinders.

Bagged material, stacked on pallets as it comes from the line, is tiered to the ceiling in storage. Cartons of finished chemical products are handled in pallet loads to save manual handling in transporting, storing, and car or truck loading.

At the Pittsburg, California, plant of The Dow Chemical Company, five Baker Fork Trucks expedite handling of material in production, storage and shipping departments.

Two of these trucks, one of them fitted with a Trayner-Reinhart cylinder carrier, transport 16" cylinders of ammonia—twelve at a time—from production to warehouse and from warehouse to shipment. Trucks load cylinders directly into boxcars, or onto highway trucks.

The remaining trucks speed handling of chemical products in bags or cartons on pallets—taking them from production to storage, where they are high-tiered to conserve floor space, and from storage to shipment, where further man-hour savings are made in loading.

Prior to the installation of the Baker Trucks, material was transported manually and hand-stacked. Cylinders were rolled by hand, one at a time. The use of the trucks has resulted in savings of thousands of dollars annually over former methods.

BAKER INDUSTRIAL TRUCK DIVISION
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Baker INDUSTRIAL TRUCKS

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Brusco HANDLING EQUIPMENT

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trol. Fluorescent lamps, including other special types, are stored in the old part of the building, where the main breakdown is by fluorescent and automobile lamps. These stacks are likewise arranged for the shortest possible hauls, inbound and outbound.

For miscellaneous items shipped in comparatively small quantities (mercury vapor and show case lamps, for example) pallet racks are maintained. These consist of standard 48" x 48" pallets with four tubular posts bolted at the corners. The pallet loads constituting the second or top layer rest on flared cups attached to the upper end of the posts. A view of these racks is included in the exhibits. Items of this "miscellaneous" merchandise are sent either in lots of few cases at a time or in less-than-standard-case quantities. The four-ft.-high posts give access to the lamps in the lower layer while making storage possible of different items in the upper layer. A "shelf stock" (less-than-standard-case) department is described later.

Large-volume orders are delivered by fork lift truck from the stacks to the outbound cars, which are loaded to maximum visible capacity. Gravity conveyor sections deliver the cases from the door to the loaders at the ends of the car.

Miscellaneous case goods are assembled on pallets transported by the hand-guided motorized trucks. These vehicles are well adapted to this type of stock selection since the operators walk along with them. A case of each of a number of different lamps is quickly selected and placed on the pallet.

The shelf stock or less-than-standard-case department (see photos) is at the north end of the truck dock. The representative stock maintained here is likewise arranged according to wattage. The lamps are stored in steel shelving 10 ft. high, which is adjustable vertically. The ends of space economy are served through this adjustable shelving, whose openings are regulated according to the size and/or quantity of the various lamp stocks. A series of benches at one side of

this department is equipped with such packing needs and tools as tape dispensers, gluing equipment, weighing scales and bins of interior packing. The packed orders are accumulated on pallets by destination and the completed loads are moved to the adjacent truck dock by hand pallet truck.

A Big Time Saver

On the opposite side of the same dock (south) is the full-case order assembly department for truck lines. The stock maintained here consists of fast-moving items only, and is arranged in 30 pallet loads. An operator assembling orders from this stock is saved the many steps he would have to make if he were to travel all over the 80,000 sq. ft. of the plant. The fast-moving items are concentrated in a few hundred square feet of space, and hence this arrangement is a distinct aid to efficiency in order selection. (This stock is replenished at the end of every work day.) The cases are here also recorded, stenciled, and labeled. A small office located in this section saves steps and time by making it unnecessary for the men to go to the main office for the processing of bills of lading.

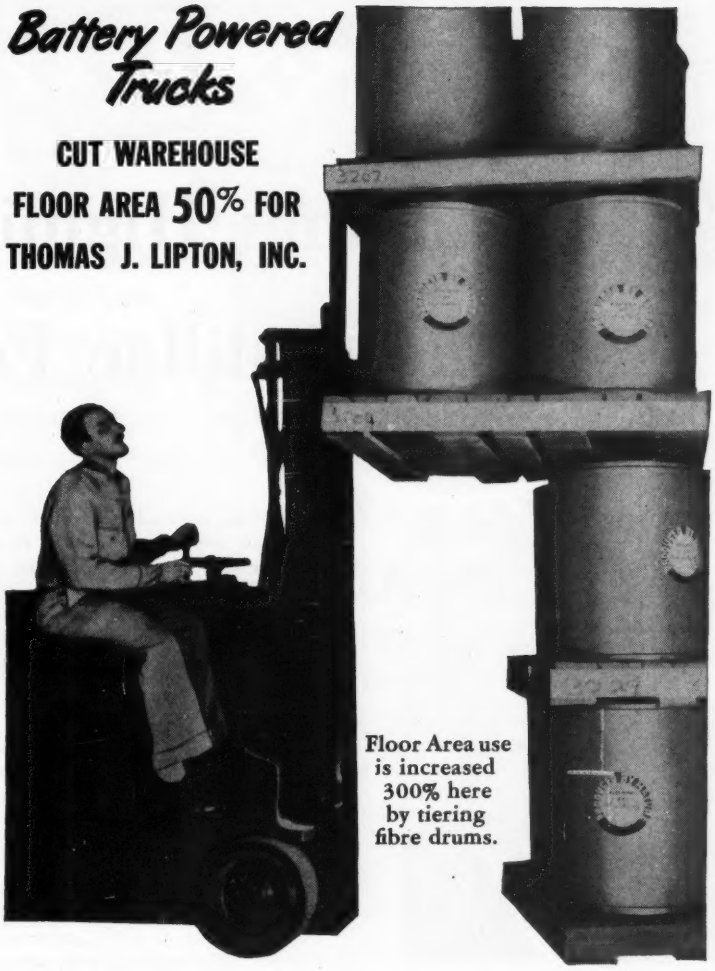
When a "solid" truck load of cases is shipped, a walkie pallet truck will usually run the loads into the highway vehicle. If a trailer bed is considerably higher or lower than the platform, sections of gravity wheel conveyor are extended into the vehicle, bringing the cases to the hands of the loaders. Without this simple conveyor set-up, a man would have to walk 60 ft. with every load he carries into the nose of a 30-ft. trailer.

Thus, all phases of the enlarged operation—from the location of doors and selection of equipment to stock arrangement and order assembly procedures — are meeting the requirements of the modernized operation: the efficient handling of inbound stock and fast on-schedule delivery of orders.

Copies of the revised Directory are available at $5 each. Order yours today. The address is 1240 Ontario St., Cleveland 13, Ohio.

Battery Powered Trucks

CUT WAREHOUSE FLOOR AREA 50% FOR THOMAS J. LIPTON, INC.



Floor Area use is increased 300% here by tiering fibre drums.

FUME-FREE OPERATION IN FOOD PROCESSING

The Soup Mix Division of Thomas J. Lipton, Inc. installed a battery-powered truck and pallet system at its Hoboken N. J. plant several years ago. Here are some of the important operating advantages gained.

Warehouse floor space area was reduced by over 50% because material could be tiered and all warehousing concentrated under one roof. The company was able to install a perpetual inventory system, handle greater incoming and outgoing tonnages. Dollars tied up in materials were cut; work was speeded up; production increased.

Mr. A. E. Cuddeback, Director of Engineering and Planning at Lipton, said, "We selected battery-powered trucks to do the job because we knew they were fume-free and would have no damaging effect on raw materials or finished food products; they operate with a minimum of fire hazard; they are trouble-free... down-time for repairs is almost non-existent."

Lipton's experience is another example of electric truck *dependability* and *cleanliness* helping industry *at lowest cost per ton handled.*

THE ELECTRIC INDUSTRIAL TRUCK ASSOCIATION
3701 NORTH BROAD STREET, PHILADELPHIA 40, PENNA.

Handling Highlights In The Cadillac Foundry

By Frank M. Prucha,
Master Mechanic
Cadillac Motor Car Division, GM Corp.
Detroit, Michigan

Adapted from a paper presented by the author—"Material Handling In Foundry Operations"—at the January meeting of the Material Handling Group of the Detroit Section of A.S.M.E. The complete text may be obtained by writing to the author.

In 1946, the Cadillac Iron Foundry was completely rebuilt and modernized. The most important objects in its modernization were (a) the elimination of as many material handling problems as possible and (b) to further improve working conditions through modernization of ventilation and heating facilities. Conveyors of all makes and types handle the vast amount of material used daily. Note (from conclusion) that the sand handling system moves one ton of sand per each 14 ft. of conveyor.

Mechanical Handling of Castings (from Molding lines to Cleaning Room)

In our sand handling systems, four molding lines—the cylinder block, hard iron, soft iron and small parts soft iron lines—produce castings.

To avoid repetition in explaining the operations and transfers involved in these lines, an attempt will be made to draw a composite picture of them by explaining one line in detail and bringing in the exceptions and alternates of the other lines.

The Soft Iron Line. Synchronized Operations

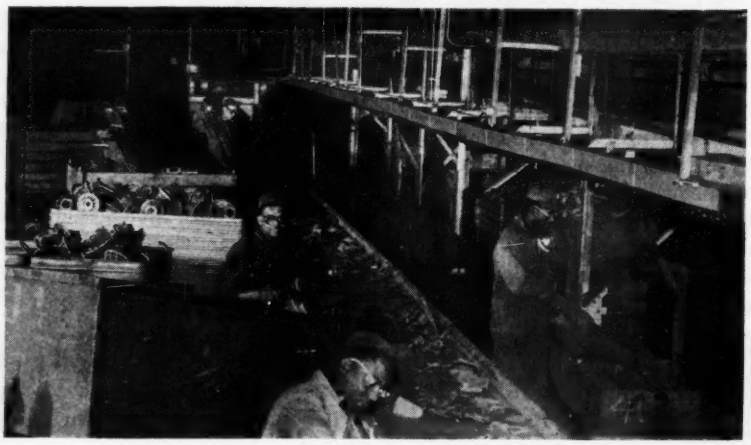
As it more closely embodies the major functions of all our molding lines, the soft iron line will be explained in detail.

A mold conveyor, consisting of 135 2′ x 3′ steel cars at 4′0½″ centers and mounted 22″ above floor with an overall length around a loop of 545′7″, receives completed molds in this particular line at the rate of 350 molds per hour from two types of molding machines.

Castings are manually poured while on the mold conveyor with a 1500 lb. hand pouring ladle from a 30″ wide steel slat, horizontal apron conveyor with approximately 60′0″ centers. The pouring conveyor is at same height as the mold conveyor and is synchronized to travel at the same speed.

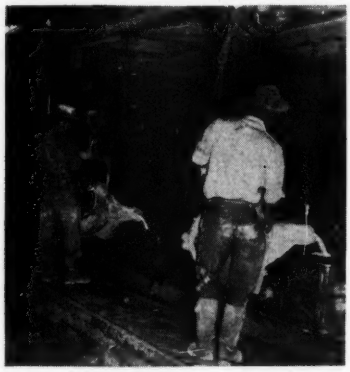
Exception to this is in our Cylinder Block line where the flasks are poured from a one-ton hot metal carrier and cab mounted on an overhead electrified track. Operator riding in this cab picks up molten iron from a holding ladle in front of cupola and transports it to block line. There, a 2″ pitch chain at approximately 45′0″ centers and mounted up high at carrier truck is engaged by a solenoid controlled trigger on cab. This chain is synchronized with the mold conveyor. The cab moving along

CASTINGS SORTING BELT with scrap iron bucket conveyor alongside. Cooling conveyor is shown at the top, right-hand side.



with the chain, therefore, is also synchronized with the mold conveyor while pouring.

After the mold has cooled and been broken, the cope flask is removed from the molding line with a hook and 500 lb. air hoist mounted on a rail and shaken out on a 3′ x 5′ shakeout machine. The flask discharges from this machine to a point midway up a 4′ wide, steel slat horizontal apron conveyor with 160′0″ centers. On some lines, old belts are



POURING LINE synchronized with the molding conveyor line.

used. Lengths vary with length of molding lines which return flask to cope flask molding machines.

In the Cylinder Block line, again, there is no cope shakeout. The 3′ x 8′ castings shakeout does double duty as the cope flask is shaken out with the casting. The cylinder block cope flask is returned to molding machines with an 80′ long two-strand chain drag conveyor and two sections of 2½″ dia. x 36″ long gravity roll conveyor.

Back on the Soft Iron line again, each drag flask is shoved from the mold conveyor with a 36″ stroke air cylinder type automatic pusher to the upper deck of a double deck 4′ x 10′ shakeout machine. The pusher is solenoid controlled and actuated from mold conveyor.

Shakeout And Cooling Lines

Sand and castings fall through flask and upper deck of the shakeout. The flask discharges from the upper deck of the shakeout to the tail end of previously mentioned flask return conveyor, which delivers flask to the drag molding machines.

Castings from shakeouts at each molding line discharge down chutes to a 4′0″ wide, steel pan type, oscillating conveyor with an overall length of 222′0″. Because of its length, this conveyor is in two sections—one 105′0″ long, the other 117′0″ long. The short conveyor is one foot above the other to eliminate striking when in motion.

Next, castings transfer to a 4′ wide, steel channel, inclined and horizontal apron conveyor at 290′0″ centers, called the castings cooling conveyor.

A 4′ x 8′ shakeout at end of this conveyor receives castings and removes any

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Smart fleet of "SPACEMASTER" Electric Fork Trucks handle many kinds of materials in this public utility warehouse.

"SPACEMASTER" Electrics operate quicker, in less space. "SPACEMASTER" Electrics have low cost maintenance, less down time. "Standrive" feature lets operator pivot and turn and thus safely trail load. No need to turn truck and load around as his vision is unobstructed. Better visibility also permits accurate placement of forks and spotting of loads . . . "Deadman" brake; greater stability; plus free, quick access from either side give greater SAFETY . . . Send For Bulletin 25 Today!

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HAND TRUCKS of special design required for many industries are run-of-the-mill stock items in the Fairbanks catalog. There's a type for every need . . . of sturdy design, high grade materials . . . and built to last. Here are some typical examples. If you don't see what YOU need—ask for it.

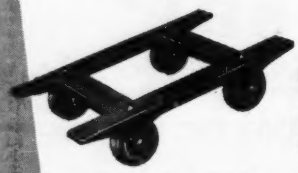
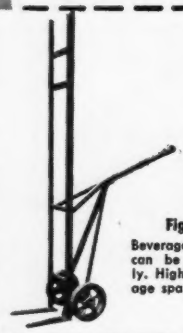


Fig. L 1191 Malleable Iron CASE TRUCK
Built to take the shock of heavy packing cases, boxes and machinery. Indestructible yet light in weight One ton capacity.

Fig. A-1448 All Steel UTILITY HANDTRUCK
Ideal for bags, cartons, cases and small kegs. Solid nose plate, curved cross bars, welded center strap; fitted with step climbers. Load rating 400-500 pounds.



Lever Trucks (Pry-Bars)
Tremendous leverage to handle heavy cases, crates, machines, etc. Raises loads 9" from the floor, 5, 6 and 7-foot lengths.

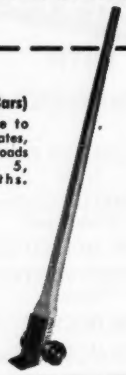


Fig. CC-10 TIER TRUCK
Beverages, cartons and crates can be handled more efficiently. High stacking cuts down storage space. Capacity 750 pounds.

Fig. 500 JACK and PLATFORM TRUCK
Efficient, low cost lift jack and platform system increases production, cuts costs. Many standard platform sizes available; special sizes to order.

Fig. 9304 HAND TRUCK
Long, sloping lines "break" the load easily. Steam-bent handles prevent crushed fingers when handling large cases.

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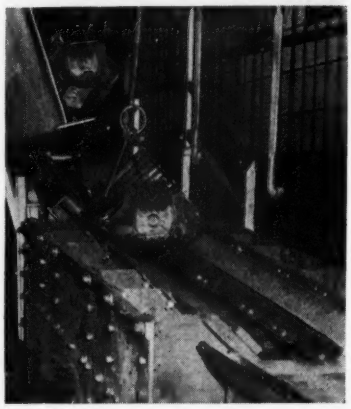
sand that may have been carried along by castings.

From shakeout, castings discharge to a 24" wide, flat, horizontal belt sorting conveyor at 142'0" centers and up approximately 3'0" from floor. This belt is in our castings cleaning room.

Handling By Air Hoist And Overhead Conveyor

Both the Cylinder Block and the transmission cases, each from different molding lines, are delivered to the cleaning room in a different manner.

The Cylinder Block after being



RELEASING cylinder block from hooks of the overhead conveyor.

shaken out and removing sprues and gates, which, incidentally, get to the cleaning room in the same manner as other castings just discussed, is loaded with a 1000-lb. air hoist and hook to a 6" overhead No. 678 chain conveyor approximately 1160'0" long.

This conveyor transports cylinder blocks through a 7'x8'x70'0" long continuous type stress relieving furnace, located near shakeout, and a 7' x 8' x 100'0" long insulated cooling housing.

Upon reaching cleaning room, this conveyor settles blocks down into a 3' x 8' shakeout. The especially designed conveyor hooks release blocks when the tension is removed.

Disposing Of Sprues And Gates

Transmission cases are manually loaded from a special 3' x 5' shakeout in our soft iron line to an overhead 4" monorail No. 458 chain conveyor, approximately 1050'0" long. This conveyor delivers cases to 48" x 48" conveyorized centrifugal impeller type shot cabinets in the cleaning room.

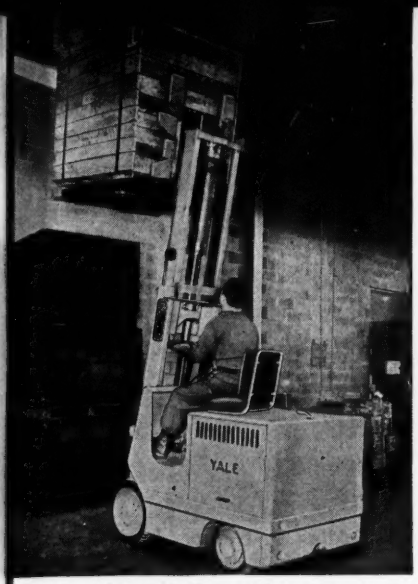
The castings on the sorting belt in the cleaning room are manually sorted out and thrown to 2' x 3' x 4' high buckets (approximately one ton) for loading into shot cabinets.

Transfer of these buckets from belt to these cabinets is done with two floor operated electrified 16'0" bridge cranes equipped with two-ton hoists.

Previously mentioned sprues and gates from cylinder blocks, as well as

(Turn to page 54)

Break bottlenecks in production and your COSTS TUMBLE



Up goes a pallet load. High stacking of multi-unit loads puts storage space to fullest use. Yale High Lift Fork Trucks handle loads up to 30,000 lbs. in a single operation. High Lift Platform Trucks have capacities up to 50,000 lbs. Low Lift models, to 60,000 lbs.

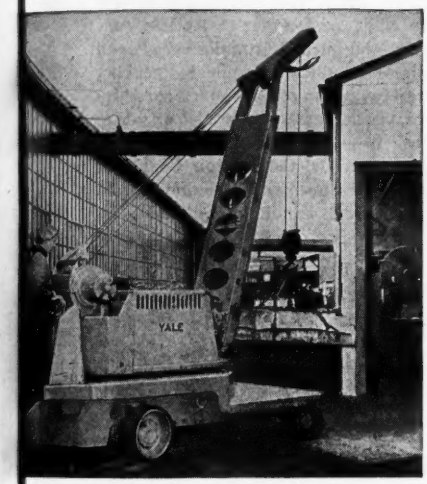
Fragile loads are handled safely and efficiently by t fast Load King Wire Rope Electric Hoist. Yale mal time and effort saving electric hoists in capacities up 12 tons. Hand chain hoists are built to lift as much 40 tons.

Production gets in a jam when material isn't kept "on the move." If you are up against this problem in your plant, it will be well worth your while to learn how modern material handling machinery can open the way to greater output.

Right now you may not know exactly what kind of handling equipment will do the best job and save money at the same time. So your best bet is to get the benefit of the experience of Yale & Towne, pioneer in the manufacture and correct application of material handling machinery.

The Yale line of material handling machinery is so complete and diversified that selection for specific requirements is easy. Whether you need hand or electric hoists, hand lift or power trucks or scales, Yale representatives throughout the nation and the world will gladly help you find ways to break production bottlenecks, save time and effort and cut handling costs.

Take care of the present and plan for the future with Yale Material Handling Machinery. Get in touch with our nearby representative or write direct to headquarters.



Yale Crane Trucks are used to lift and stack all kinds of loads in plant and yard. They also transport material, speed assembly of machinery and handle many maintenance jobs. They slew and boom easily, travel fast. Capacities up to 10,000 lbs.

"Easy lift, easy roll, easy steer" summarizes the qu ities of Yale Hand Lift Trucks. Because they can han so much in a single trip, they help break product bottlenecks. Capacities range up to 20,000 lbs. Platfo pallet and tin plate models.

TOOLS THAT KEEP INDUSTRY "ON THE MOVE" — YALE

THE YALE & TOWNE MANUFACTURING CO.

Department L-112

Roosevelt Boulevard Philadelphia 15, Pa.

This Worksaver Electric Truck has a telescopic lift of 10 feet and can handle loads up to 3,000 lbs. The operator steers the truck as he walks. Lift and tilt are hydraulic. Nine other Worksaver models include high and low lift platforms, pallet and tin plate, and a tractor.

Yale Load King Scales provide the unparalleled accuracy of the exclusive MAGNETROL mechanism. They speed weighing, batching, counting, measuring and testing. There's a model for every industrial need—every type from bench to crane scales. Capacities to 60,000 lbs.

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MATERIAL HANDLING MACHINERY · hoists . . hand and electric · trucks . . hand lift and power · industrial dial scale

"Bulk" Handling Solutions

For Coal and Powdered Clay

By Allan F. Hardy, Jr.,
Plants Engineer
Norton Company, Worcester, Mass.

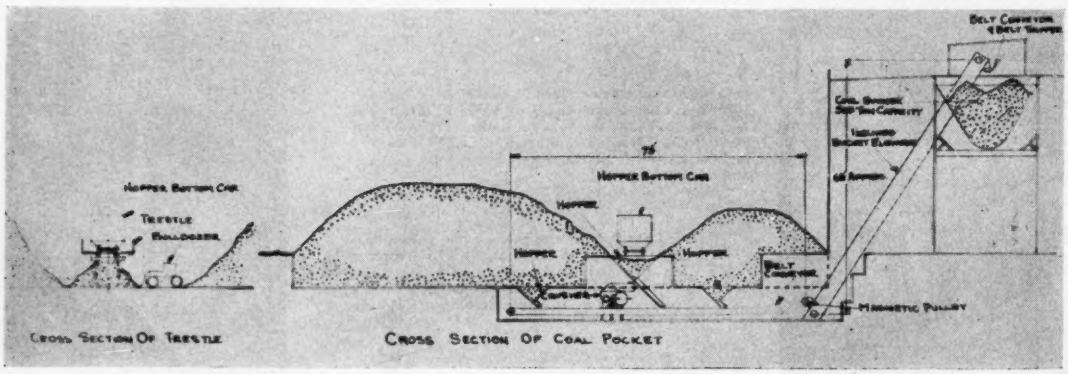
THE Norton plant spreads over a considerable area, extending a mile as the crow flies, from one corner to the other. It has 124 buildings varying in size from the new single-story wheel plant, with a floor area of 204,000 sq. ft., down to the smallest which has an area of 100 sq. ft. The total floor area amounts to 2,519,000 sq. ft. While this size, in itself, is no guide to the material handling problems, the large area over which the company spreads, coupled with its many multi-story buildings and the nature of the product, create material handling problems peculiar to the Norton Company. Furthermore, the "job-shop" nature of the operations creates special difficulties from a mechanical handling point of view.

Adapted from a paper delivered by the author before the Boston Chapter of the American Material Handling Society.

Among the materials handled are crude abrasive ore, processed and sized abrasive grain, raw lump clay, pulverized clays and other materials, unburned and burned grinding wheels and abrasive products, chemicals, packing materials, packaged abrasives for shipment, fuels, and thousands of other items. In carrying out the handling of these materials, the Norton Company, employs, in one manner or another, all of the usual handling equipment in-

Fig. 1 — Installation view shows coal piled beside the railroad trestle.

Fig. 2—Cross section of concentrated storage for less handling.



cluding pallet trucks, lift trucks, conveyors, bucket elevators, railroads, motor trucks, etc.

The solutions to a few of the rather special handling jobs found in the Norton operations will be discussed.

Handling of Coal

The company's power house, a pulverized coal plant, is capable of generating 180,000 lbs. of steam per hour at 690 lbs. pressure. The electrical output runs from 3000 to 3500 Kw. About 30,000 tons of coal are consumed annually. Under today's uncertain conditions, it is desirable to have several months' coal requirements stored ahead at all times. This always presented a problem since the former method of storing on the ground wasted space. It also required multiple handling; was dangerous since loose piling led to almost continuous pile fires; contamination of coal with gravel from the surface of the storage yard was common; and stratification of the pile was always with us.

Fig. No. 1 is illustrative of the solution. A depressed coal pocket, like a large swimming pool, was constructed of concrete beside the power house, and a railroad trestle erected across it as shown. Whenever possible, incoming cars are dumped directly into the hoppers; if this is impossible, the coal is dumped through the trestle and into the pocket where it is distributed, rolled and stored by bulldozer. As required, it will be bulldozed into the conveyor hoppers.

Fig. No. 2 shows a cross-section of the coal storage area, trestle, conveyors, and hoppers. It includes complete details of the revised storage method. Note tracks, bulldozer, power house, coal piles.

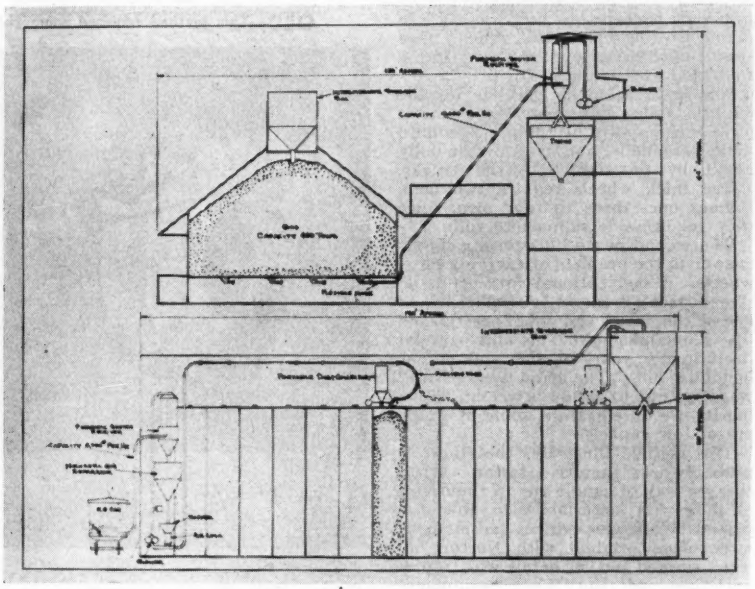


Fig. 3—Diagram of pneumatic handling system is explained in article.

Correcting the Shortcomings

Coal used to be received in gondola cars, and unloaded by a clamshell bucket for storage. The coal was spread on the ground on both sides of several spur tracks. When needed for steam, the coal was reclaimed by the same method into cars and was again unloaded, this time into the hopper of the conveyor leading to the coal bunkers of the power house.

A more concentrated storage, with reduced handling, better compaction to reduce fires, and speedier operation was indicated to correct the shortcomings of this method of handling coal.

The extreme compaction, now obtained, prevents coal pile fires.

Thus, the original method involved a bucket pickup, dumping, reclaiming, and dumping into the hopper. To this is compared the single trestle dump, with spreading, storing, and reclaiming by bulldozer.

The cost savings amount to 37c per ton, or about $11,000 annually. Since this project cost $96,000, about 8½ years amortization period must be allowed. However, the savings due to reduced breakdowns caused by gravel in the pulverizer, less spontaneous combustion and trestle fires, etc., will shorten this period considerably.

Pneumatic Handling of Pulverized Clays and Other Bonding Materials

This presents another special material handling project. In the preparation of ceramic bonds thousands of tons of powders are handled annually. These were formerly received in bulk,

(Turn to page 58)

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Forever is a long time—but that's KW's way of saying Battery Reliability . . . and that's exactly how long KW Battery service lasts on the KW Perpetual Power Plan!

Ask about our cost-guaranteed-in-advance plan! It's the maintenance man's answer to *continuous* top battery performance! Rugged, heavy-duty KW Batteries withstand constant *severe* railroad use—*that's why we can afford to guarantee service in ANY field!* There's no "price" battery in the KW line because KW sells power, *forever!*

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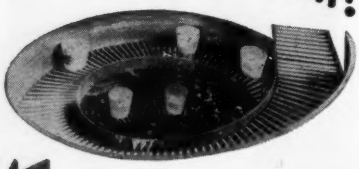
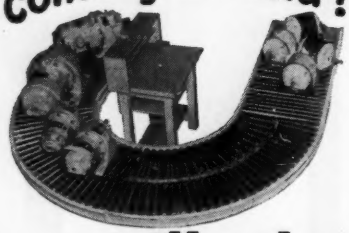
what's your problem?



coming around?



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For the efficient, continuous flow handling of materials, conveyers have no equal. No other type of material-handling equipment can be made to cope with the complex problems which are being solved today by well-planned conveyer systems.

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The Easy Way . . .

By ALLAN F. HARDY, JR.

Plants Engineer
Norton Co., Worcester, Mass.
Adapted from a paper delivered by the author before the Boston Chapter of the American Material Handling Society.

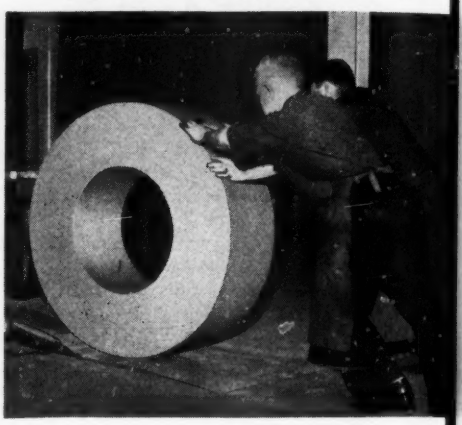
HANDLING of all sizes and shapes of grinding wheels is Norton's business. The usual run of sizes—from pin-head size up to 40" in diameter—are moved in conventional manner. However, a special problem is found in handling the larger wheels for the crankshaft, file or knife industries. Such products may be as large as 72" in diameter and up to 14" thick. One simple device developed is shown in the following two pictures.

The large grinding wheel is for the cutlery trade. For years these wheels have been handled by rolling them onto dollies manually, and drawing the dolly about by powered industrial trucks. Large thick wheels require two men, thinner ones three to four men, since they require side support to roll.

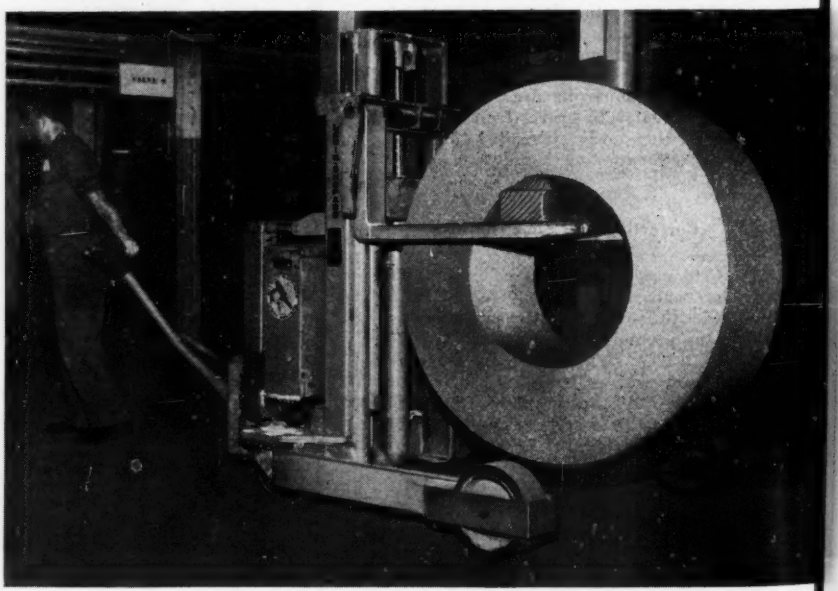
The second photo illustrates a simple answer to the problem of carrying large wheels. A conventional fork-lift hand steered truck is shown. A timber is laid across the forks and the wheel picked up—a one-man job! This unit paid for itself in 2½ years on this and similar handling jobs. The hand steered unit was used due to its lower weight, allowing its use on elevators, some of which are of low capacity.

This method illustrates that there is probably a simpler, faster, safer, cheaper way to handle any of thousands of industrial materials than now employed. While new devices and methods were often original with Norton, all were worked out in detail with representatives of the many equipment manufacturers involved.

OLD—This method required some tussling.



NEW—Now operator walks with the load.



Now This Truck Does 10 Times More Work

In The DEMPSTER DUMPSTER SYSTEM

Picks-Up, Hauls, Dumps Four Railroad Cars of Materials Daily!

Before the Dempster-Dumpster Hoisting Unit was installed on the above truck chassis, it was one of 10 conventional trucks being loaded by hand. Now, the truck hoisting unit has replaced all 10 trucks. In many plants handling materials by the Dempster-Dumpster System, one Truck Hoisting Unit has replaced from 5 to 10 conventional trucks. In each plant a single hoisting unit handles many containers. In one particular installation, one unit serves 37 detachable containers of various types and sizes, ranging from 2½ to 8 cu. yds. This plant produces, daily, approximately 220 cu. yds. (about 4 car loads) of materials of every description, including rubbish, scrap and finished product. This daily output is handled in only eight hours by the Dempster-Dumpster equipment. Containers are spotted at materials' accumulation points throughout the plant. When each container is filled, it is picked up by the truck hoisting unit, carried to the point of disposal, set down intact or dumped and returned for refilling. The entire operation is hydraulically controlled and handled by only one man, the driver. This modern system is eliminating much equipment investment in industrial plants. It is cutting maintenance costs, tire and gas requirements. But, most important, it increases production with a minimum of manpower. Don't assume that your problem is different—that the Dempster-Dumpster System of materials handling is not applicable to your problem. Such cases have happened, only to discover later that this equipment was exactly the type needed. Our most difficult job in our advertising is to make the wide use . . . the flexibility and simplicity of the Dempster-Dumpster operation clear to the reader. It will pay you to investigate the Dempster-Dumpster System now! A product of Dempster Brothers, Inc.

Pictured at left is a standard drop bottom type container in three stages of operation—on the ground, in carrying position, and dumping.

DEMPSTER BROTHERS

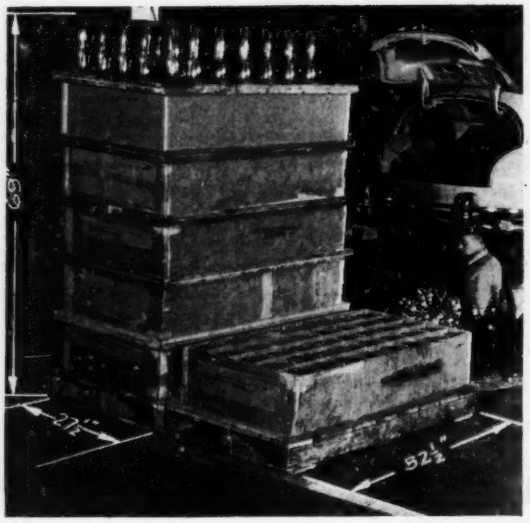
840 N. KNOX, KNOXVILLE 17, TENN.

DISPOSABLE PALLET with coil springs; 50 per layer.

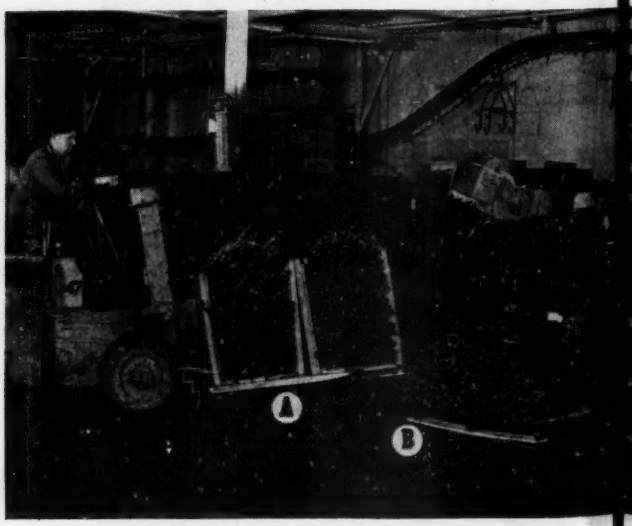
THREE LENGTHS of steel strapping secure bumper pack.

Engineered Loads Solve a Problem of Long Supply Lines

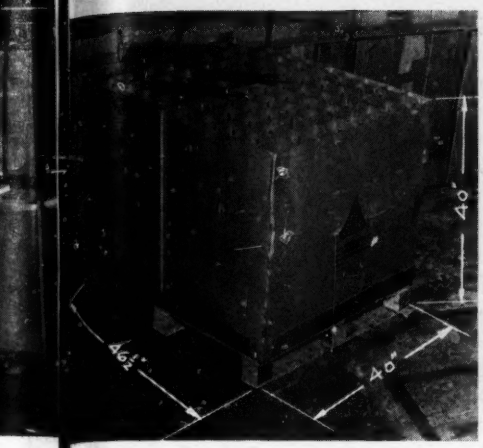
By C. E. PFLUG
Plant Enginer, and
LEO BALLARBY
Material Handling Engineer
Nash Motors, Division of Nash-Kelvinator Corp., Kenosha, Wis.



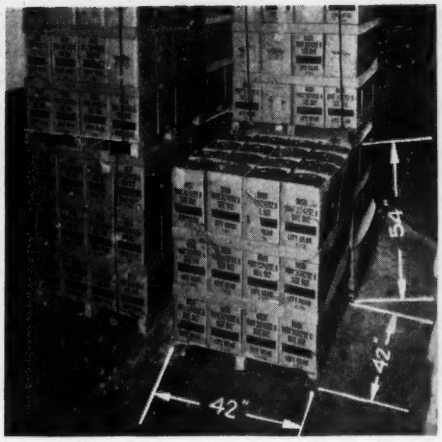
THIS IS TRAY PACK for bumper bars. It is reusable.



STEERING LINKAGE. A—one-way pack. B—on pallet.



SHOCK ABSORBERS: paper board box, disposable pallet base.



BRAKES in tubes on ¼" single face wooden disposable pallet.

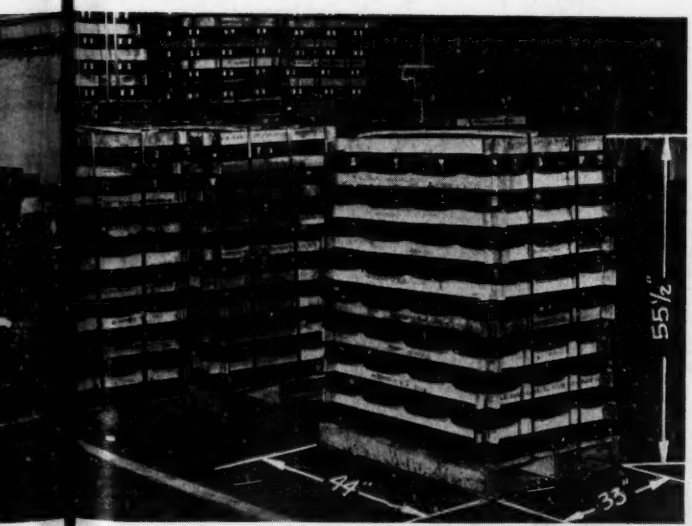
CORRUGATED PALLET BOX for grilles; fiberboard pad (top).

Unitized packs at Nash Motors Division serve a vital need in relation to storage capacity and production schedules. The nine typical load units reviewed here also apply to a large variety of non-automotive products. Simplicity of design is a feature.

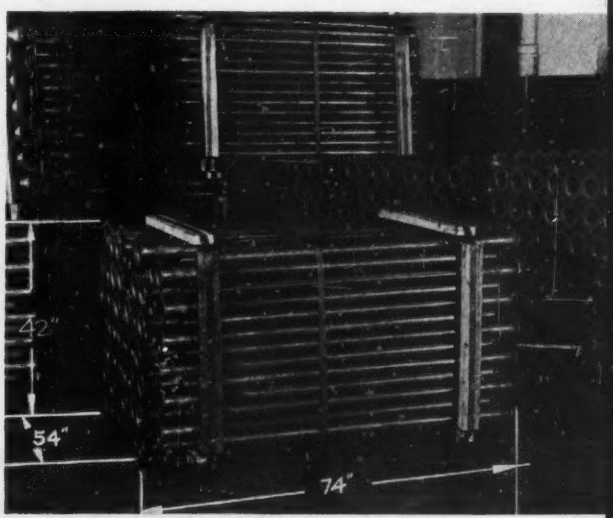
THE Nash Motors plant in Kenosha, Wis., is 330 miles from Detroit, the center of the automotive industry and the source of many of the component parts required for Nash automobiles. While a percentage of components originates from sources closer to Kenosha, a characteristic feature of the assembly operation is that it is dependent on rather long supply lines.

Importance Of Engineered Load Units

Nash has always operated on the principle of quick turnover of parts, and for the volume required for more than 600 passenger automobiles produced daily there is relatively little storage space. A partial explanation is the scheduling of delivering carriers at such a rate that high production can be maintained with relatively low banks.



HUBS, DRUMS: 2130 lb. on standard hardwood pallet.



STEEL STRAPPING and 2x4 pieces pack torque tubes.

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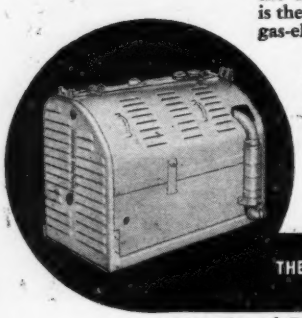
PROVIDE CONSTANT POWER FOR TRUCKS

The modern method of power used in speeding the Missouri Pacific's crack "Colorado Eagle," is the same principle employed by Ready-Power gas-electric Units. Used extensively throughout Missouri Pacific's warehouses and shops, Ready-Power-equipped electric trucks are preferred everywhere for their constant power, flexibility and long life. To get the most out of your electric trucks equip them with Ready-Power Units. Write for descriptive literature.



THE READY-POWER CO.
3838 Grand River Ave., Detroit 8, Michigan

This makes the stream of common carriers, in effect, "temporary storage conveyors". But scheduling alone could not cope with the problem. Equally important as the scheduling function is the load unit method which is being applied on an ever widening scale.

The load unit method is a prime factor in explaining the absence of a sizable parts warehouse. If the handling of individual component parts were required, the present storage space would not be nearly sufficient. Moreover, it can safely be said that there would hardly be enough manhours for building the stacks and relocating the stockpiles (when new loads arrive, for example) and, finally, for feeding them to the points of use along the line. Such piece-by-piece handling would be a gigantic and unending task.

Another consideration enters into the problem of long supply lines in connection with load units. The exclusive use of permanent or reusable containers would involve both heavy traffic in empties and a large expenditure on freight for their return. For this reason Nash is encouraging vendors to ship in one-way or disposable packs. Hence this review of typical unitized packs includes a number of load carriers of this type, in addition to several returnable ones.

Varied Items. Continuing Experiments.

Coil springs offer a good example of a unit pack shipped in a non-returnable container. At present these items are received in a tray pack (37"x38½") consisting of two layers, as shown in the exhibits. Fifty springs compose each layer, or 100 per load. The top, the separators in the center and the bottom tray have 4" high sides, which serve as retainers. The bottom tray is glued to a standard corrugated paper board pallet base, giving a double pallet effect. The load is secured with four lengths of ¾" steel strapping, two in each

direction. The total load weight is 800 lb.

After a pack has been accepted as satisfactory it may be subjected to further tests, which may result in modifications that make for greater economy. As an example, some test shipments of these coil springs are now being made (in the same kind of pack) with three layers instead of the two being used at present. If the larger load unit should meet the requirements satisfactorily, then it will be adopted as standard for this item.

The pack for bumpers has several points of interest, partly because of the simplicity of the materials used. There are approximately 40 bumpers per pack. The load is built up on three 2x4 pieces which serve as stringers (for entry of truck forks), with ¼"x4" wood spacers between the layers. The load is eight bumpers high and five deep. As can be seen from one of the exhibits, the bumper ends are protected with sleeves of dimpled kraft paper. A covering of heavy kraft paper is used as an outer wrap, and the load is strapped with three lengths of 1¼" band iron. Total weight is 1000 lb. per unit.

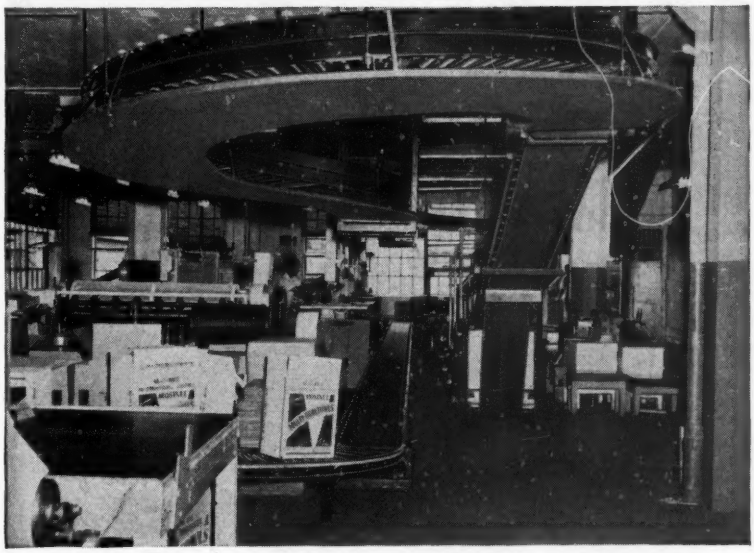
Disposable Pallets. Returnable Packing.

While simple wood stringers support the pack for bumpers, the "quantity" pack for shock absorbers consists of a corrugated paper board pallet box on a disposable ¼" wooden pallet base. The box is made up of cells which are divided in four equal sections. With 40 cells in each section and five shock absorbers per cell, the four sections have a combined capacity of 800 units. The box size is 39" wide by 48" long by 34" high. The light-duty wood pallet base is a four-way entry type. Four bands of ¾" steel strapping tie the load to the pallet. Total weight is 2110 lb. per unit.

A tube type of pack is used for brakes, which is also shown in one of the exhibits. This load is likewise supported on a ¼" single face

Start With Any One of These

FOUR WAYS To Cut Your Handling Costs



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2 with a HANDIBELT

— a small, light, compact, easily portable and maneuverable conveyor unit that stacks, loads, unloads cases, cartons, packages up to 135 lbs. in weight. Can be used inclined, declined or horizontal. Electric motor operated.

3 with SPIRAL CHUTES

— effective time, work and money savers lowering pieces, parts, packages floor to floor. Scientifically designed and properly pitched—available in many types and sizes. Cost nothing to operate.

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— provide swift, sure, safe transportation of messages, documents, blueprints, samples, small parts, money; cylindrical or oval tubes 1½ inch upward with dispatching and receiving terminals for complete systems to meet your needs. Write for special bulletin SPT.

Write for Standard's general Catalog No. FL40. Tell us what you want to handle or name equipment on which you want more information.

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4000-POUND AND 6000-POUND

MOTOW LIFT

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THESE FOUR SUPERIORITIES

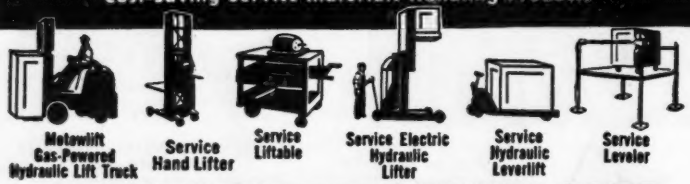
POWER—*plenty!* With that dependable, rugged, 6-cylinder FORD Industrial Engine.

CLUTCH—Years in development! The *Best* from Borg-Warner.

DRIVE-AXLE — Heap on the punishment! Its special Timken-Detroit combination axle and constant-mesh transmission can take it!

CONTROLS — Single-lever. Pioneered by Service; refined to new performance levels.

Cost-Saving Service Materials Handling Products



Motowlift Gas-Powered Hydraulic Lift Truck | Service Hand Lifter | Service Liftable | Service Electric Hydraulic Lifter | Service Hydraulic Leverlift | Service Leveler

SERVICE CASTER & TRUCK CORP.

Executive Offices: Albion, Michigan

Plants at Albion, Michigan and Somerville 43, Mass.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

See Your Classified Telephone Directory for Nearest Distributor

wooden pallet, with four-way entry, whose blocks are attached to ¼" stringers.

The brakes come in cartons (or tubes) three layers high, 16 tubes per layer, seven pieces per container. The tube has a folded tab bottom and all 16 in each layer have a common top. As in the case of the other packs mentioned, steel strapping secures the load to the pallet base. Total weight is 2215 lb.

An interesting variation is introduced in connection with a corrugated pallet box in which grilles are received. This 33½"x42½"x26¾" container is supported on a disposable paper board pallet. It accommodates 32 grilles in two layers of 16 each. The grilles are separated by fiberboard pads with two circular spacers on each. While the corrugated cartons are not returnable, the somewhat costly fiberboard pads are. They are collected in one place as the grilles are used in the assembly, and are returned to the vendor for reuse. The carton is secured to the paper board pallet base with four lengths of strapping wire. The container itself is salvaged and used for shipment of parts to the Nash assembly plant in California.

A Reusable Container

The tray pack for bumper vertical parts is one of several examples of the reusable types of shipping containers used. These bars, or bumper guards, are 10" high, 5" wide at the widest point and 6" deep. This high-volume item is shipped from Detroit (four bars are used per car).

The outside walls of the container are of a double thickness of 500 lb. corrugated paper board, supported on a single face hardwood pallet. The 27½" width and 52½" length of this container is five cells wide and eight cells long, and built up with separators six high. This gives a total of 240 pieces per load.

The ¼" plywood separators can be seen in one of the accompanying exhibits. They have 1" retainer strips on all four sides. These

company-owned pallet boxes, designed by the Nash Motors material handling engineering department, are returned to the vendor for reuse. The weight of this load is 600 lb.

Like the other unit packs mentioned in this discussion, these loads are placed in the line for use of the assembly operators. The cell construction of the container makes it unnecessary to unwrap or otherwise manipulate individual pieces; they are removed from the cells and used as needed. Four of these pieces are required for each of the 600 automobiles produced, or 2400 bumper bars per day. At 240 pieces per container, this means that 10 packs are sufficient to take care of daily production. This quantity is readily tiered in compact space in the assembly line.

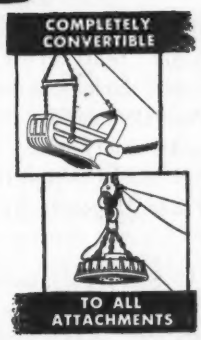
If, as a random example, only 20 of these items were packed per container, this would amount to 120 "individual" cartons of the old type. With this method of packaging, it is not difficult to visualize the extra handling-hours and congestion that would result. While in this typical example the number of packs is multiplied by 12 in order to arrive at the equivalent number of old-style individual containers, that figure would be 20, or more, in the case of other items.

Interesting Modifications. Simplicity.

The "quantity" packs help avoid wasteful practices and conserve manufacturing space. Relatively few unitized loads constitute a bank for the day's requirements. Thus a margin of safety in view of the close schedule is maintained without difficulty, and in-plant traffic is held to a minimum. It must also be borne in mind that, in addition to the contribution made to efficiency within the plant, an equally important contribution is made in loading time on the vendor's shipping platform as well as in unloading time at the receiving point.

In the shop, various types of re-

(Turn to page 51)



This 50,000 pound Mobile Crane is a completely new member of the UNIT Crane and Shovel line. Designed for both "on and off" highway operation. So compact, it works efficiently even in small, cramped quarters, "in or out" of the yard.

- Rugged Construction
- Perfectly Balanced
- Hook Roller Construction
- Operated by ONE Man
- Powered by ONE Engine
- Hydraulic Steering
- Air Brakes and 4 Speed Air-Actuated Transmission
- Heavy Duty, yet operated with remarkable SPEED . . . SAFETY . . . ECONOMY!

UNIT 1520 can be equipped with retractable high A-Frame to permit capacity loads on extended boom at long radius.

UNIT CRANE & SHOVEL CORPORATION

6531 W. BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U. S. A.

SHOVELS • DRAGLINES • CLAMSHELLS
CRANES • TRENCHOES • MAGNETS

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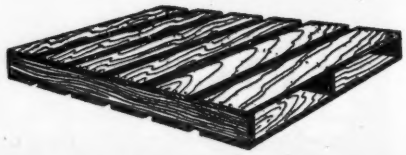
ON THE  PALLET

NEWS • VIEWS • TRENDS

PAUL P. BARKER, president of National Production Co., has announced the sale of the Safe-Line Wire Rope Clamp business to the recently formed manufacturing and distributing organization, National Safe-Line Clamp Co., of which Walter Therssen is owner. The new firm is located at 11252 Nine Mile Rd., Van Dyke, Michigan. Therssen stated that no change would be made in the clamp's construction.

A TRANSPARENT plastic rainshield for fork truck operators which fits into the metal safety shield above the operator has been adopted for use at the Army's Seattle Port of Embarkation. The rainshield, 1/16" thick, was developed at the suggestion of the Port Commander, Brig. Gen. Fenton S. Jacobs. The metal safety guard itself is an Army addition to the fork trucks used at the Port.—*Department of Defense, Trade Magazine Newsletter.*

A SAFETY guard for pallets loaded with small, loose materials has been developed at the San Francisco Naval Shipyard for use with overhead cable hoists. It consists of an iron frame, fitting over the palletized material, to which a U-shaped bar is attached on each side. The bars slip down on contact to form a lifting arm under the pallet. The frame above is covered with mesh wire to box in any loose material. —*Department of Defense, Trade Magazine Newsletter.*

ELMER F. TWYMAN, general manager of Automatic Transportation Co., has stated that 1950 looks like a good year, if businessmen will work to make it one. However, the public is more cautious than a year or two ago about spending its money. He declared that there is still a large market for a product that is produced efficiently and priced properly. The manufacturer who wastes the consumer's money with obsolete production methods that keep his price high will soon find himself priced out of the market. More than ever, business is paying attention to economies it can establish. The field of materials handling is one of them, and in recent years interest in reducing costs has spurted, Twyman said.

W. GORDON BENNETT, general manager of packaging and materials handling, Anaconda Copper Mining Co. and subsidiary companies, has been named general chairman of the Fifth Annual Industrial Packaging and Materials Handling Exposition. This was announced by R. C. Sell, president of the Society of Industrial Packaging and Materials Handling Engineers, which sponsors this event. The show will be held in the Arena of Philadelphia's Convention Hall, October 10 through 12.

THE More Power to America Special, first train of its kind in industrial history, will be launched on a nationwide tour this spring by General Electric's Apparatus Department. Exhibits of more than 2000 electrical products, processes and techniques ranging from precise aircraft instruments to complex working models of steel mill, textile and other industry equipment, will be displayed in nine cars of the train. The train will visit the country's key industrial centers for inspection by utility and industrial executives and municipal leaders. Since it is an industrial development enterprise, it will not be open to the general public.

TEN freight cars were needed to transport a new belt press which will vulcanize the largest size conveyor belts in the new $5,000,000 belt plant of the B. F. Goodrich Co., Akron. Weighing 332 tons, the press was manufactured by the Baldwin Locomotive Works and is believed the largest of this type ever built. It has an overall length of more than 50 ft., width of nearly 13 ft., is 14 ft. 7½ ins. above the floor and nearly six ft. below the operating floor.

AMERICAN Pallet Corp. has opened its Cobleskill, N. Y., factory for manufacturing and fabricating pallets. Repair lumber is stocked and distributed from a second factory and warehouse in Hoboken, New Jersey.

A NEW corporate entity known as The Prime Mover Co. has been formed in Muscatine, Iowa, by the Home-O-Nize Co. of that city. Both firms are headed by C. M. Stanley, who is also president of the

(Turn to page 82)

MEN IN THE NEWS

THREE new district managers of industrial truck sales for the Hyster Co., Portland, Oregon, have been announced. Donald R. Shaffer has been promoted to manager of a territory comprising southeastern Canada, eastern Michigan, northern Ohio and southwestern New York. John F. Wright will take over truck sales supervision in a large western area of the continent, including Alaska, western Canada, Washington, Oregon and parts of Montana and Idaho. Truck sales in the Hawaiian Islands and several western states including California, Arizona, Nevada and Utah, will be under the direction of Karl T. Barr, who was formerly with the Caterpillar Tractor Co., Peoria, Ill.

CROSBY M. Kelly has resigned as director of advertising and sales promotion at Rapids-Standard Co., Grand Rapids, Mich., to assume new duties as executive manager of the Chicago Lake Front Fair. He has been succeeded as advertising manager by Claude V. Meconis.

THE Eriez Manufacturing Co., Erie, Pa., has announced that B. A. Roosevelt has been promoted to the position of sales manager. He replaces George R. Wellmon, who resigned. Roosevelt will now direct sales and advertising. He has been advertising manager of the company for three years. Previously, he was assistant supervisor of publicity at the Erie Works of the General Electric Co.

THE Whiting Corp., Harvey, Ill., has opened its own district sales office in the M & M Building, Houston, Texas. Elmore C. Brown, who has been with the company for more than 10 years, has been appointed district manager for the Houston territory. For the past five years he has been a sales engineer in the Whiting Chicago district office.

LINK-BELT Co., Chicago, has announced the opening of a factory branch store and warehouse at 2630 Holmes St., Kansas City, Mo. The office is housed in a two-story building with a total floor area of 13,200 sq. ft. Stocks of conveying and power transmission machinery parts, chains, sprockets, bearings, speed reducers, elevator buckets, etc. will be carried. Arthur J. Olson is the district manager.

MARSHALL C. Taylor has left his post as media director for The Goodyear Tire & Rubber Co. to take a similar position with Meldrum and Fewsmith, Inc., Advertising. At Goodyear, Taylor was in charge of all research, schedules and budgets involving all national media, radio, television, trade papers, magazines and newspapers.

Discover how wonderfully small trifling expenses mount up to large sums.

—Ben Franklin's Almanac, 1757

A single per cent saved here and another per cent saved there strengthens thy working capital for the coming year.

—Acme Steel's Notebook, 1950

Look, Mr. Management, how long has it been since you walked through your shipping room and checked up on your packaging operations?

How long since you sharpened your eye and your pencil on ways to save in shipping and materials handling?

Helping you save money, time, materials, labor is where Acme Steel comes in. Nine out of ten companies start cutting costs when they reach for the telephone and call in one of our sales engineers and get the benefit of what we have learned to do with Acme flat steel strapping, Acme stitching machines and wire, and other Acme Steel products.

We show you here two specific examples of savings by our customers. If you want more evidence, we have hundreds of actual case studies to show you. In fact, more than 45,000 Acme customers are getting the benefits of Acme Methods now. Call the Acme Steel service office nearest you. (There are 45 of these offices in the principal cities of the U.S. and Canada.) Or send the coupon below for more details on your special problems.

OLD WAY: 20c per package
ACME STEEL WAY: 2½c per package
SAVINGS: 87½%

Milwaukee firm securely bundles 20 electric fence posts and insulators with three pieces of Acme Steelstrap.

ACME STEEL

Material costs cut 43%
Labor costs cut 50%
Shipping weight cut 7%

In addition, Acme Box Stitching Methods improved carton strength and durability for Connors Brothers, Ltd., sea food canners in Newfoundland.

Under the American business system of open competition, Acme Steel has enjoyed sound, steady growth. Since 1901, Acme Steel has made 283 consecutive dividend payments to its stockholders.

ACME STEEL CO. CHICAGO

ATTACH THIS COUPON TO YOUR BUSINESS LETTERHEAD

ACME STEEL COMPANY, Dept. F-40, 2840 Archer Avenue, Chicago 8, Illinois

We manufacture_____. Please send me booklets on Acme Methods checked.

- ☐ Please have sales engineer call.
- ☐ **Packaging, Shipping, Materials Handling**—"Savings in Shipping" tells how to save money and safeguard customer good will with Acme Steelstrap.
- ☐ **Shipping (Carload and L.C.L.)**—"Acme Unit-Load"—The story of reduced damage claims and better handling for shippers.
- ☐ **Bag and Box Assembly**—"Profit by Stitching" demonstrates cost-cutting Acme Silverstitchers and Acme-Champion Stitchers.
- ☐ **Product Assembly**—"Acme-Morris on Metal Stitchers"—for savings in fastening metal-to-metal or metal-to-other materials.
- ☐ **Book Assembly**—"Acme-Morrison Book Stitchers" for savings in the graphic arts field.

NAME_____POSITION_____
COMPANY_____
STREET_____
CITY_____ZONE_____STATE_____

ACME STEEL CO. CHICAGO

MULTIWALL BAGS LOADED BY FORK TRUCK

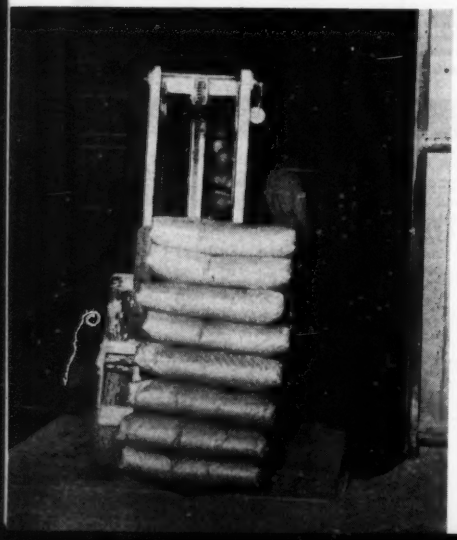
THIS photo series describes a method of loading bagged materials in box cars by fork truck. A somewhat unusual factor is that the distance of the truck's run is only 15 ft. Another factor is that the bags are loaded by the vehicle whose only attachment is the forks. The bags are held in place by friction as the forks are withdrawn.

The material is a granular, free-flowing type, 100 lb. per bag. The daily output from each of two bagging operations is 125 tons, or a total of 250 tons for the plant. Three fork lift trucks are employed, one of which serves for stand-by and maintenance purposes. Six to eight box cars are loaded daily, also an occasional flat-bed trailer. The economies obtained were considerable. After charging the operation with depreciation on the equipment, gasoline and maintenance costs, the net gain was 22 cents per ton over the cost of the previous method. On the basis of 250 tons loaded daily, the total saving amounted to $55. At this rate, the trucks were paid for in less than three months of operation.

The short run of 15 ft. from the conveyor chute to the car door is significant for two reasons. One: Frequently the application of a fork truck is not considered advantageous on such a short run. Two: The saving would be greater if a longer run were involved.—*Data and photos for this report were furnished by the Clark-Hopkins Equipment Corp., Philadelphia.*

1 BAGS SLIDE from chute on fork; it is lowered progressively. Second man squares bags, runs conveyor. Truck operator then . . .

2 BACKS UP to receive the second stack of 100 lb. multiwall bags on front of fork. Truck makes a turn and a short run to the . . .



3 FREIGHT CAR, as shown. Note the safe loading ramp. Note, too, that bottom bag sags on fork—important in loading because . . .

4 THE STACKS of bags are held by friction as fork is withdrawn. The second operator steadies the bags, straightens them when necessary.

ENGINEERED LOADS . . .
(Continued from page 47)

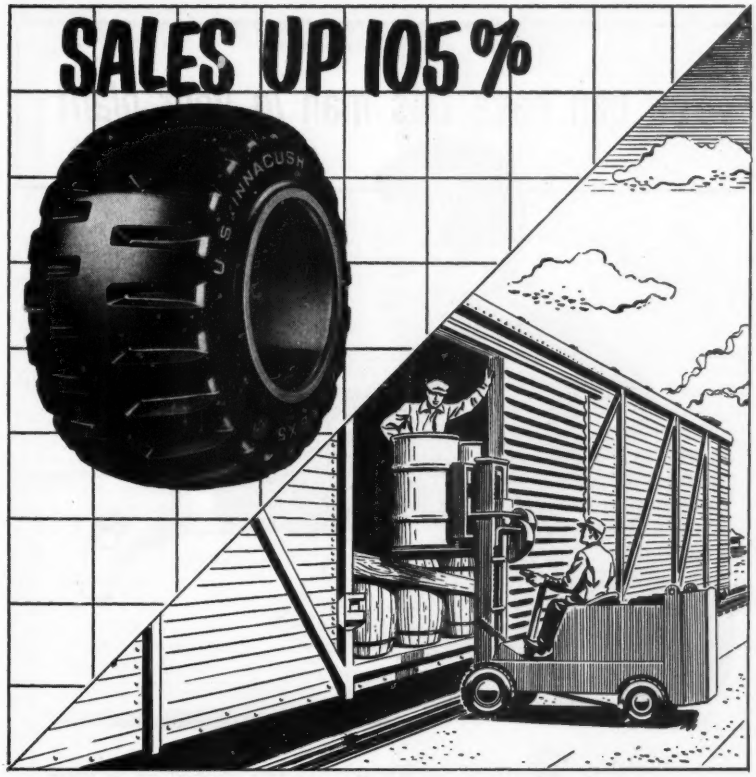
turnable and disposable load carriers are likewise used to make up packs that are economical from the standpoint of (a) handling, (b) space use and (c) efficiency in feeding the items to processing or subassembly operations.

Steering linkage is one type of part that comes both in a non-returnable and on a reusable pallet pack. The one-way package is made up of crating lumber and steel strapping. Across two 2x4 stringers is placed 1"x6" planking for a load-supporting surface (22" x 24"), with a 2x4 upright at each corner. Each of two lengths of 1¼" steel strapping is tensioned over the uprights at one side and under the overhang of the load-supporting surface, as shown. The snipping of the steel bands makes the contents available at the processing stations. The weight of this load is 1000 lb.

Steering linkage is also received on a standard 40"x40" double face hardwood pallet. Here, too, steel strapping is the only other packaging item employed. Two of the four bands used are strapped around the steering linkage only, making a self-contained unit of the material. The other two bands strap the 2000 lb. load to the pallet.

The load unit of hubs and drums offers another illuminating example of the numerous modifications possible with the tray pack in conjunction with standard hardwood pallets. The pallet base is 33"x44", with the load built up nine high by use of 1"x2½" wood separators which are notched at the corners. Eighteen pieces make up each of the nine layers.

The voids created by the hub extensions are filled by reversing several of the pieces. Two 2"x6" boards are laid across the top separator for support of two bands of ¾" steel strapping. The weight is 2130 lb.



Why Do So Many "Supers" Prefer U. S. INNACUSH?

Sales prove smart plant "supers" have gone all out for U. S. Innacush . . . for every materials handling job requiring industrial trucks. Why?

Because the U. S. Innacush:

- ★ Reduces steering gear and bearing maintenance.
- ★ Minimizes damage to fragile loads.
- ★ Has a tougher, deeper tread for long, even wear and easy steering.
- ★ Uses a special inner cushion rubber for maximum shock absorbtion, yet increasing carrying capacity.
- ★ Gives greater riding comfort.
- ★ Less subject to chipping and cutting.
- ★ With its lug tread design—gives maximum traction even under extreme loads.

U. S. Innacush is available in a complete range of sizes for almost every industrial truck, and is only one type in a complete line of U. S. Industrial Tires ready to serve your materials handling needs.

Your U. S. Royal Distributor can show you how the U. S. Innacush and the entire U. S. Industrial Tire line will save you money, and how his on-the-spot service will cut your "down time" costs. He's in the Classified Telephone Book —call him today.

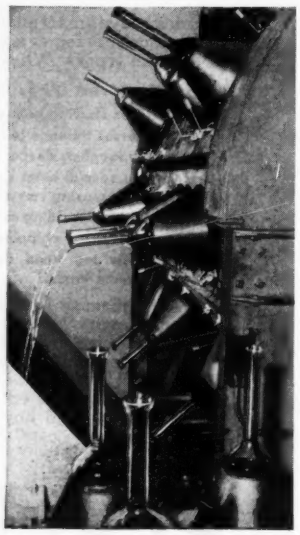
U. S. ROYALS

***a product of* UNITED STATES RUBBER COMPANY**

You can have this man *in your plant*

HAS A THOUGHT like this popped up in your mind at one time or another?—I wish we could have a man come into our plant on a temporary basis for a few days, possibly a couple of weeks—to sort of look over the way we handle material and process our work and see if our methods could be improved upon—an experienced, practical man with a good background—one who can come up with the right answers—and show us how actual savings could be made to produce at less cost.

Well,—you have just made a contact with that kind of man. We will lend-lease him to you. He will take hold of your material handling problems and quite likely come up with some ideas that can be turned into definite manufacturing advantages. Make an appointment with him today; phone TWinbrook 2-3040 or write *Allied Steel & Conveyors, Inc., 17314 Healy, Detroit 12, Mich.*



Settling Conveyor—designed to apply phosphorus deposit to television tubes. It virtually eliminates screen defects, breakage losses, and increases production—another Allied Specialty Engineered Installation.

CONVEYORS AND CONVEYOR SYSTEMS—*designed, fabricated erected—or present systems remodeled and rearranged.*

ALLIED DOES THE WHOLE JOB . . . from beginning to end!

here is for torque tubes, the diameter of whose flanged end is approximately three times that of the narrow end. These items have a length of 62". The photo of this load unit shows that an even pack is obtained by reversing the tubes at each end, which compensates for the flange. The package is 70" long and 41" wide. The tubes are piled on 2x4 stringers, with an additional two-by-four at each side (front and back) and another at each end on top of the load for tensioning the two bands of 1¼" steel strapping. The 196 pieces making up the load weigh 2235 lbs.

Not One Piece At A Time

Thus the engineered "packages" make the scheduling of parts effective, and quick turnaround time of vehicles is obtained. Storage space can be held at a minimum, and handling manhours are used economically because of the practice "not one piece but a load at a time". This principle avoids several moves after the material comes into the plant.

According to Works Manager E. W. Bernitt, at Nash Motors material handling is an integral part of the over-all plant layout function. The engineers responsible for laying out the machines and assembly lines are also responsible for the material flow. Thus material flow is considered as part of plant layout.

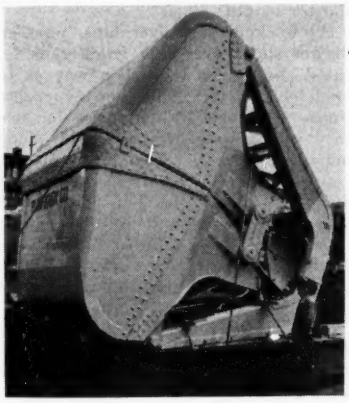
Furthermore, the material handling study of load units is a continuing program which is carried on under the direction of a full-time material handling engineer. As stated earlier, the examples given here are a few chosen from among a great many, but they are representative of the valuable work being done by Nash Motors. The company has been palletizing since 1938.

The studies on palletized and other unitized packs are done in cooperation with suppliers. The unit pack has to be so designed, according to Works Manager Bernitt, that it will be a cost-saver for

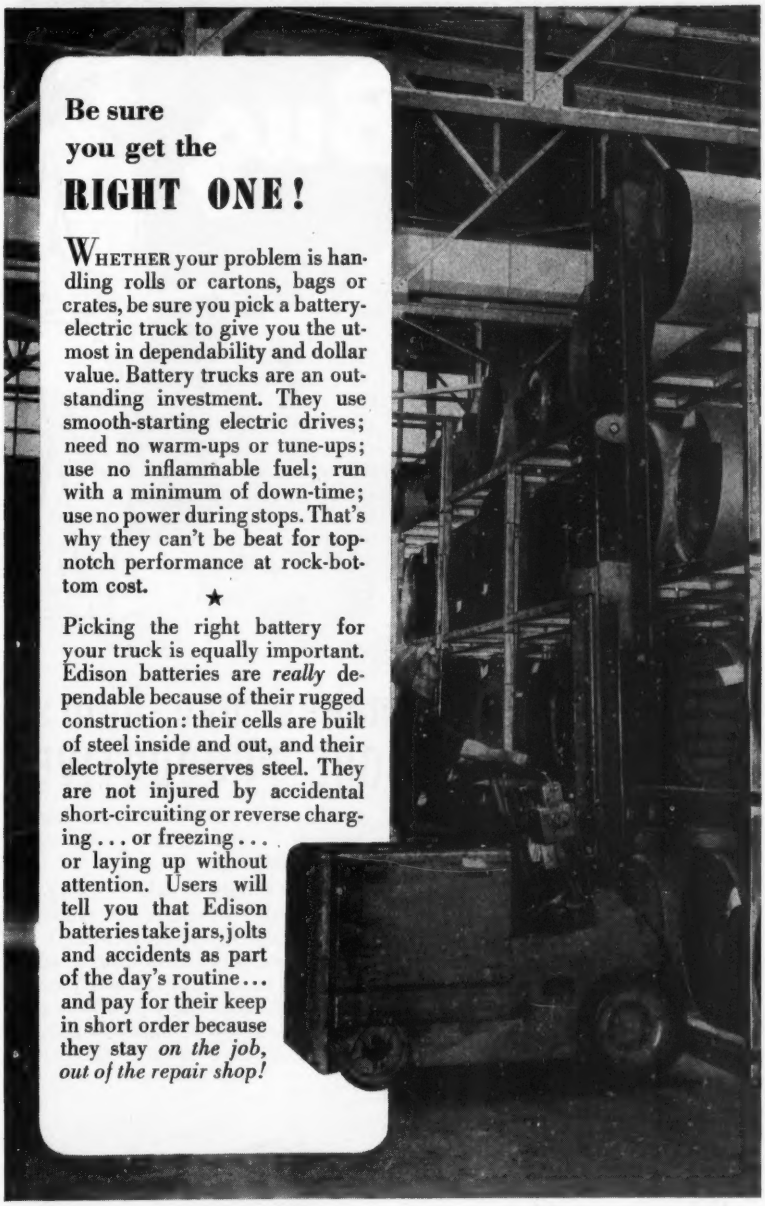
the vendor as well as the user. Usually a design for a new pack is developed in this manner. Nash engineers suggest the idea to the vendor, who later reports back on its feasibility, whereupon an agreement on a procedure is reached. When the company enters into purchase negotiations with a new supplier, the question of the type of package is settled as the purchase is made.

Finally, overengineering is guarded against. Economies effected by combining hundreds of units in one pack can be nullified by complicated designs. The examples reviewed make it apparent that simplicity is a watchword throughout. This simplicity of design goes a long way toward explaining how Nash Motors is meeting the problem of long supply lines—effectively.

"BIGGEST" CLAMSHELL — The largest clamshell bucket ever shipped by Blaw-Knox Co. in fully assembled form is shown being readied for shipment to a plant on the Chesapeake Bay. A four-rope type bridge bucket, it will be used to transfer coal from water craft to storage piles or hoppers. It has



a capacity of 17 tons and three lifts of the unit will fill a standard railroad coal car. Because of the size of the bucket, it was necessary to load it on its side in a specially depressed car and give it a circuitous routing to avoid tunnels and low clearance points on the railroads. This special routing more than doubled the total shipping distance. The bucket is 9′ 11″ wide; open length 21′, closed length 14′7″; open height 18′5″, closed height 15′11″. It has a heaped capacity of 680 cu. ft.



Be sure you get the RIGHT ONE!

WHETHER your problem is handling rolls or cartons, bags or crates, be sure you pick a battery-electric truck to give you the utmost in dependability and dollar value. Battery trucks are an outstanding investment. They use smooth-starting electric drives; need no warm-ups or tune-ups; use no inflammable fuel; run with a minimum of down-time; use no power during stops. That's why they can't be beat for top-notch performance at rock-bottom cost.

★

Picking the right battery for your truck is equally important. Edison batteries are *really* dependable because of their rugged construction: their cells are built of steel inside and out, and their electrolyte preserves steel. They are not injured by accidental short-circuiting or reverse charging . . . or freezing . . . or laying up without attention. Users will tell you that Edison batteries take jars, jolts and accidents as part of the day's routine . . . and pay for their keep in short order because they stay *on the job, out of the repair shop!*

WRITE TODAY for free booklet SB 2039 and a current price quotation. You'll find Edisons cost little more than other makes of batteries . . . and they pay this back over and over in terms of low upkeep and long, long life.—*Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, New Jersey. In Canada, International Equipment Company, Ltd., Montreal and Toronto.*

EDISON

Nickel · Iron · Alkaline

STORAGE BATTERIES

Typical Truck Battery

makes man-hours
3 TO 4 TIMES MORE PRODUCTIVE

New Kwik-Mix Moto-Bug, with big, 10-cu. ft. capacity hopper, hauls 4 times as much material per trip as an ordinary hand wheelbarrow . . . averages more trips per hour because power does *all* the hard work.

Operator has full power, forward and reverse for traveling, spotting and backing up. No pushing, *no pulling*. Drives 1½ to 4 m.p.h. in *both* directions, easily takes full load up 20% ramps.

There's less operator fatigue, too, because Moto-Bug has easy, positive steer by lever direct to dual wheels. Extended steering lever converts to "T" . . . clutch, brake, throttle levers are conveniently grouped . . . riding step is available, so operator can ride while he works, take it easy, get more work done.

Hopper body is quickly interchangeable with 4-ft. flat-bed platform for carrying loads up to 1200 lbs.

Platform has stake pockets for sideboards . . . tilts for easy pull-away when unloading.

Engine is *standard-make* . . . 4 h.p., 4-cycle gas. All parts are readily accessible. That means less maintenance time, more work-time. It will pay you to see how Moto-Bug can make your man-hours 3 to 4 times more productive. Contact your Kwik-Mix distributor of write to us direct.

Mail today KM27

to: KWIK-MIX COMPANY, Port Washington, Wis.

Send us bulletin, prices on Moto-Bug with: ☐ 10 cu. ft. hopper ☐ 1200 lb. flat-bed.

NAME _____ TITLE _____

COMPANY _____ DEPT. OR DIV. _____

STREET _____

CITY _____ STATE _____ FL

KWIK-MIX COMPANY
PORT WASHINGTON, WIS.
(Koehring Subsidiary)

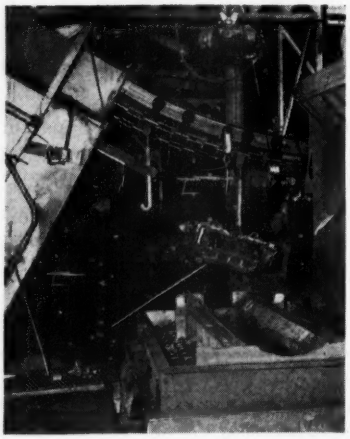
CADILLAC FOUNDRY . . .

(Continued from page 36)

from other castings on other lines which have been conveyed to the cleaning room, are sorted out on sorting belt and manually loaded into 2′ wide x 4′ long x 1′ high buckets at 6′8″ centers and suspended from a 4″ monorail No. 458 chain conveyor approximately 540′0″ long which runs along sorting belt.

Buckets carry scrap iron up an incline in conveyor to one of two scrap iron concrete storage bins.

At rear sides of each bucket is a pro-



AIR HOIST loads block on overhead conveyor.

truding length of pipe that serves as a dumping aid. Alternate buckets on conveyor are equipped with pipes of shorter length.

As buckets pass over bins, pipe on bucket slides over two guide rails located above bins in such a way as to hold back bucket while conveyor continues its travel. This causes buckets to pivot around their single chain mounting, thus unloading contents. Guide rails are spaced closer together over the second bin. This means that only buckets with short pipes will dump in the second bin. Buckets with long guide pipes, however, dump into both bins, but as they are emptied on first dumping, this is of no consequence.

Any further transfer of scrap iron from concrete bin to cupolas is performed with ten-ton crane equipped with a five ton electric magnet.

Tailings Separation System

Tailings is a sand and ferrous waste or refuse. In all four molding line systems, sand and ferrous tailings are conveyed to a common separation area. This is done in the following manner:

Magnetic tailings chute and breaker screen sand tailings chute from both the Cylinder Block and Hard Iron line systems, combine in their down-flight and together discharge to a 24″ wide troughed inclined belt conveyor with 42′0″ centers.

Chutes from the Soft Iron and Small Parts Soft Iron systems discharge to another 24" wide, troughed and inclined belt conveyor at 71'0" centers travelling in the opposite direction and equipped with a magnetic pulley. This conveyor also received tailings from former belt.

Combined tailings of all four systems pass over the magnetic pulley, where ferrous material is removed and discharged down a pan at floor level. Remaining sand tailings discharge to a vibrating screen where fines are removed from tailings by dropping through the screen to a pan beneath. Lumps and hard balls of core sand are discharged at end of the screen to still another pan.

Magnetic tailings are used in cupolas; fine sand passing through the screen is dumped in a mold sand dump area for conveying to reclaim system. Core lumps and tailings, discharged at the end of the screen are sent out as refuse. These amounts are negligible. Advantages of this system are confined to utilization of floor space, minimum manpower requirement and centralized maintenance operations.

14 Ft. Of Conveyor Average Ton Of Sand Hourly

In summarizing our mechanical sand handling systems, the following points should be noted:

Our PREPARED CORE sand handling system receives and prepares the required type of core sand at the rate of 80 tons per hour. Prepared core sand is delivered to the core room at the rate of 10 TPH. 800 lin. ft. of conveyor, 300 ft. of which is a monorail track, are required to do this.

WASTE CORE sand is removed with 375 lin. ft. of conveying equipment and reclaimed along with waste molding sand from molding lines and castings

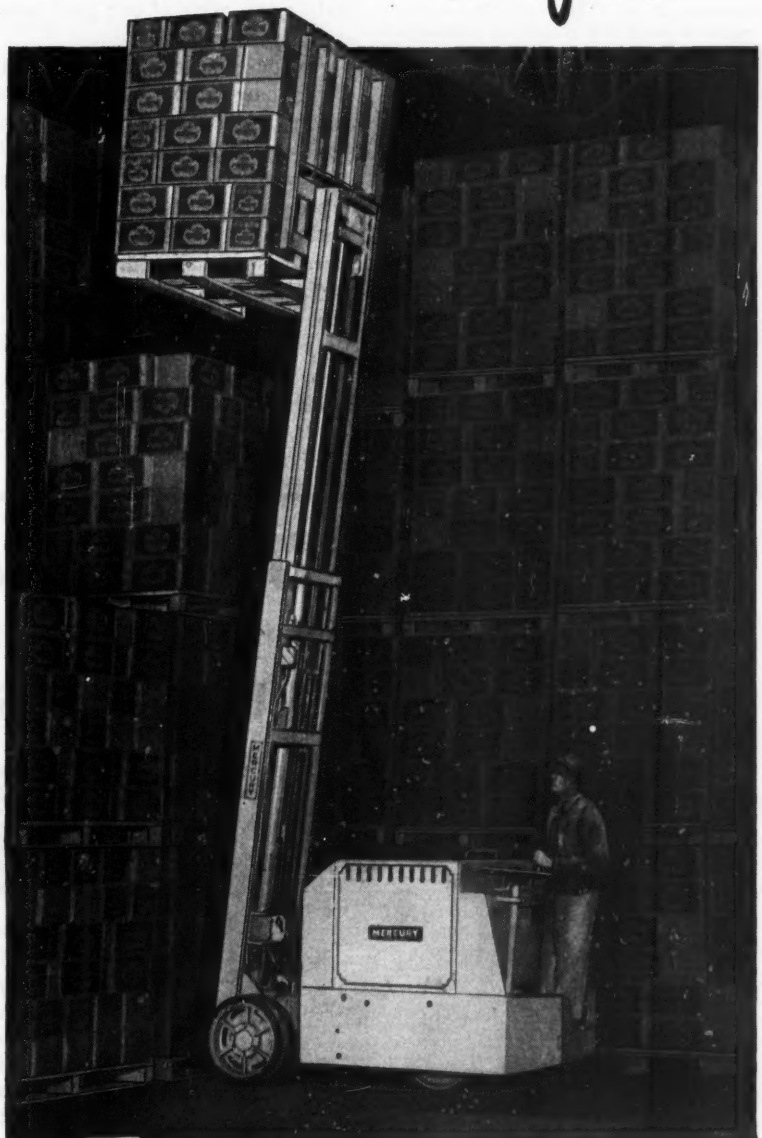
LOADING SCRAP IRON bucket conveyor from the castings sorting belt in the cleaning room.

cleaning room at rate of ten tons per hour. Sand passes through approximately 400 lin. ft. of 2½" pipe line in delivery to and processing in our Sand Reclamation Building.

The four molding line systems—Cylinder Block, Hard Iron, Soft Iron and Small Parts Soft Iron systems—prepare and recirculate molding sand at rate of 50 tons per hour. Approximate average of 1200 lb. of new lake sand are added to each system per hour with dump trailer and feed hopper to replace sand

• Tiering to 26 feet, quickly, accurately and safely. One of a fleet of MERCURY Fork Trucks aiding this large company to fully utilize warehouse space with minimum cost. Compact design permits easy maneuverability . rear control feature provides added safety and better vision when tiering loads. MERCURY'S 40 years' experience designing, manufacturing and installing handling equipment is available without obligation. Ask to have a MERCURY Sales Engineer call.

Stack TO THE Rafters



MERCURY

TRACTORS • TRAILERS • LIFT TRUCKS

Truck illustrated is a Mercury Rear Control "Yak."

THE MERCURY MANUFACTURING COMPANY
4154 S. Halsted St., Chicago 9, Ill.

lost by burning out, ventilation and spillage. An average of 670 lin. ft. of conveying equipment is required to handle and prepare the sand in each molding line system. In all four molding lines, a total of 2700 lin. ft. of conveying equipment handle a total of 200 tons of molding sand per hour.

The molding line refuse is collected and combined for separation in a single area. 110 lin. ft. of conveyors are required to do this.

Sand carried by castings to our cleaning room is collected and stored for miscellaneous foundry use such as padding of floors for dropping cupola bottoms. 70 lin. ft. of conveying equipment is used for collecting purposes.

In conclusion, it would be well to note that a total of 4400 lin. ft. or over ¾ of a mile of conveying equipment is used in our Foundry to handle a maximum of 300 tons of sand each hour. This means that to handle one ton of sand per hour requires the use of 14 ft. of conveyor. This speaks well for such a belt system.

JOB FOUNDRY...

(Continued from page 25)

ially over unpaved yard areas in inclement weather.

The saving in shoveling and powered travel are two big factors that soon add up to increased production. The effortless movement of large loads is a third factor making for efficiency. In two to three hours one man can transport enough sand to the foundry or core room to last for several days.

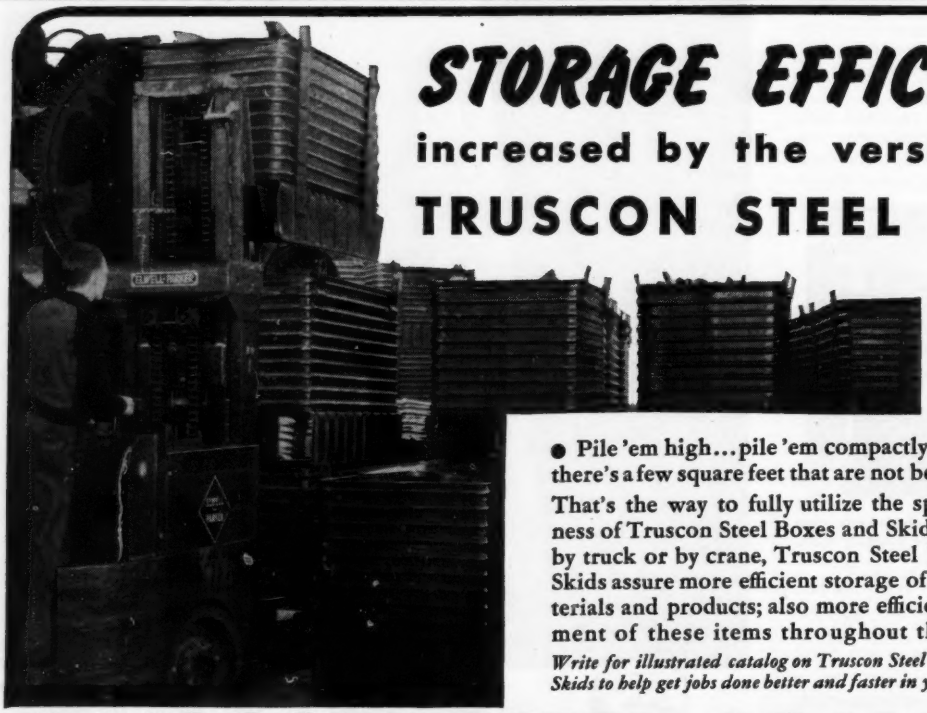
The scoop is demountable and can be replaced by a 30"x42" platform. This attachment is used for transporting flasks from yard storage to the pouring room. Approximately two acres of our yard area are devoted to flask storage.

Previously, a man working with a wheelbarrow had a full-time job moving the flasks from and to the storage stacks. The wheelbarrow could accommodate only one of the larger flasks, or two at the most. With the powered vehicle six or seven flasks can be transported at one time on its platform. Again, since the effort of pushing is entirely eliminated, the fatigue factor is appreciably minimized. Flask handling has become part-time work, with more time gained for other tasks which can be done with the powered barrow.

One of these is the transporting of refuse, which is developed in considerable quantity by a foundry. The barrow is regularly used for removing the refuse from the cleaning room and core shakeout department.

The distance is usually several hundred feet in each direction, which is also the case on the other tasks mentioned. The vehicle rolls easily on its pneumatic tires, and carries a payload of 1000 lb. For yard travel during the winter, a tire chain is used, which overcomes handicaps due to the weather. Snow on the ground, shown in the photos, is no obstacle.

The powered barrow has found ready acceptance by the operators. It has made the job easier and, because of the absence of the need for physical exertion, also a safer one. The management of our company is planning the addition of one more unit, since the present one is in use at times when it could be used elsewhere to advantage.



STORAGE EFFICIENCY
increased by the versatility of
TRUSCON STEEL BOXES and SKIDS

● Pile 'em high... pile 'em compactly... put 'em wherever there's a few square feet that are not being used profitably. That's the way to fully utilize the space-saving orderliness of Truscon Steel Boxes and Skids. By hand, by truck or by crane, Truscon Steel Boxes and Skids assure more efficient storage of parts, materials and products; also more efficient movement of these items throughout the plant.

Write for illustrated catalog on Truscon Steel Boxes and Skids to help get jobs done better and faster in your plant.

TRUSCON STEEL COMPANY

PRESSED STEEL DIVISION • 6202 TRUSCON AVENUE • CLEVELAND 4, OHIO
SUBSIDIARY OF REPUBLIC STEEL CORPORATION

FLOW DIGEST

The subject matter contained in each of the following digests was obtained from the magazine to which we give credit below.

Manufacturing and Industrial Engineering, February 1950. "Mechanized Handling Paces High Volume Production," page 26. One manufacturer of cordage installed an overhead conveyor, an intra-plant railroad, castered work carriers, and powered rolling equipment. A better product was one of six benefits. Goods now reach operators when needed, production delays are eliminated. For handling coils of rope, tines of a fork truck are moved together, forming a ram. A maintenance program is an important feature.

Brick & Clay Record, February, 1950. "Shop Hints", page 60. A pictorial report of handling methods collected from several companies. Shown are the use of vibrating feeders; rubber disc idlers to prevent building up of sticky clay on belts; multi-tined fork trucks which handle seven pipes simultaneously for loading. The handling of bulk materials by crawler-mounted cranes and tractors.

Building Supply News, February 1950. "Know What Each Piece of Coal Handling Equipment Will Do For You", page 80. An analysis of handling equipment for coal yards including portable and fixed belt conveyors, bucket loaders, front end loaders and tractor-type scoops, trimmers, and power propelled conveyors. How to plan coal yard layouts, also the use of radial bins. Case studies.

Ice & Refrigeration, February 1950. "Frozen Food Concern Improves Facilities With New Refrigerated Storage Space", page 55. Fork truck-pallet system for storage of frozen foods, also for loading delivery vehicles. Because of the highly perishable nature of the products, they must be handled quickly and with as little exposure to temperature changes as possible. Walkie-type trucks are pictured in various operations.

Mill & Factory, February 1950. "Drudgery Removed From Mill Operations", page 100. Straight-line production for cold rolling strip and sheet brass. Modern handling equipment is said to be responsible for the mills to continue processing the original bar as a unit. Vacuum cup and roller conveyors help protect the metal by preventing dents, pits, gouges and scratches. Other equipment includes roller conveyors and cranes equipped with specially engineered grabs. Also:

"Moving Day for 1000 Machines", page 116. How a company moved its operations to a new plant five miles away; manufacturing methods were completely changed as well. The operation was staggered over a period of months. The company's fork trucks moved smaller equipment; rollers and a truck winch handled heavier equipment. Also:

"19 Men Do The Work of 54", page 137. At a West Coast U. S. Naval Station warehouse, stock selection trucks are propelled by a chain conveyor located beneath the floor. The chain is 1600 ft. long and circles around bins which contain some 140,000 items. Handling and selection procedures were simplified. Work simplification has been extended to packing departments.

Rock Products, January 1950, page 102. "Highlights of Operating Developments" from drilling and blasting through processing operations. How crawler-mounted cranes with various attachments are employed. Application of belt conveyors and their layout. How idlers prolong belt life, including: stockpiling, crushing, maintenance, batching and dust collection.

Bakers Weekly, February 20, 1950. "Take The Hand Out Of Bread Handling", page 42. Conveyorized handling from wrapping to outgoing vehicles. Product damage and shipping costs were decreased, storage area increased. Slat and belt conveyors are employed. Another method pictured is the use of castered and fixed racks which are carried by the delivery trucks.

NO = Down Time

Plant Superintendent looks at

MONARCH SOLID TIRES

No down time for tire maintenance — right! But that's only part of the story. Monarch Solid Tires have an extra long service life, so they lower materials handling costs that way, too. They're tough, stable, sure-footed, and they can't puncture — Monarch-equipped vehicles go anywhere in the plant.

Monarch specialization pays off for you in better industrial tires, including such types as Monarch Easy-Roll, Cushion, Static Conductor, and Neoprene Tires.

Write for specific information on the use of Monarch Solid Tires in your plant. THE MONARCH RUBBER CO., 501 Lincoln Park, HARTVILLE, OHIO.

Specify Monarch Solid Tires on your industrial vehicles. Replacement tires available from the manufacturer of your equipment.

MONARCH

Specialists in Industrial Solid Tires and Molded Mechanical Rubber Goods

Handle Your Materials
with
load-floating
cost-cutting
Colson Trucks

More stuff handled with less effort and cost when your plant is equipped with Colson trucks. Hand trucks, barrel and drum trucks, platform trucks, dish trucks, Lift-Jack Systems, dollies, wheels and casters —all designed for ease of movement, floor saving, extra durability. Less "push" means popularity with workers, profits for you. Write us or consult your phone book for the local Colson office.

WRITE TODAY FOR FREE 56 PAGE CATALOG

Colson Drum Truck model #6055-65, has ballbearing 10" double steel disc type wheels, demountable cushion rubber tires, rugged lightweight tubular steel frame. Chimb hook locks semi-automatically.

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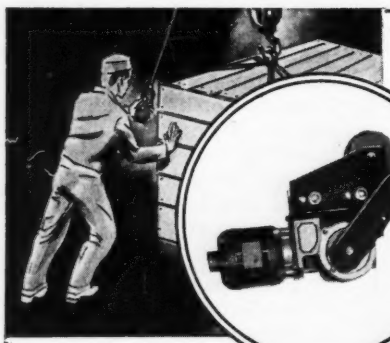
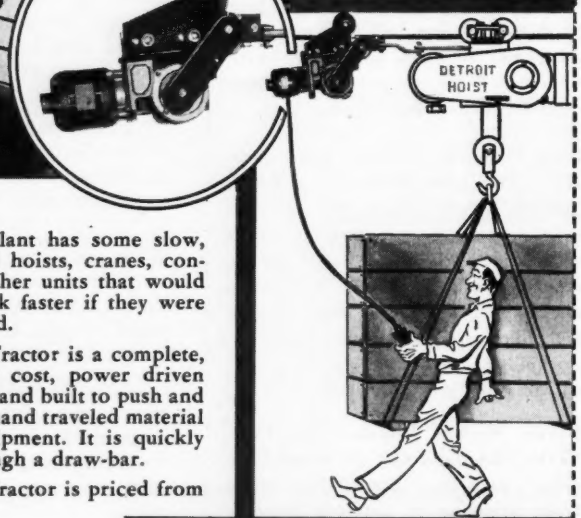
CASTERS • • LIFT JACK SYSTEMS • • INDUSTRIAL TRUCKS



SIMPLY ADD A
Trojan TRACTOR
for POWER TRAVEL



Most every plant has some slow, hand traveled hoists, cranes, conveyors and other units that would do more work faster if they were power traveled.

The Trojan Tractor is a complete, compact, low cost, power driven unit designed and built to push and pull existing hand traveled material handling equipment. It is quickly attached through a draw-bar.

The Trojan Tractor is priced from $360.00 up.

Bulletin 810 will give you further information.

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Company_____
Address_____

BULK HANDLING . . .

(Continued from page 39)

hauled from the box cars by wheelbarrow, dumped into elevator hoppers and delivered to storage by bucket elevators. As the materials were required, they were removed from the bulk storage by hand, hauled manually again to elevator hoppers and delivered to overhead storage tanks by bucket elevators, from where they flowed by gravity to a weighing larry.

The old, manual methods used for handling powders was costly and unsafe. The overhanging material was prone to slide, and allowed foreign materials to get into the ceramic raw ingredients.

Fig. 4—Aeration units and pneumatic pickup at bottom of storage bin.

Fig. No. 4 illustrates diagrammatically the new methods installed for the pneumatic handling of bulk powders.

Points to note: 1. Removal of powders from car pneumatically. 2. Delivery to bulk storage by this means. 3. Escape valve on bin. (Portable dust collector.) 4. Removal from bulk storage to surge tank pneumatically and delivery to weighing larry by gravity.

The success of this system depends upon the aeration of the powder, which enables it to flow and be collected pneumatically. Each third storage bin has an elevated floor as shown in the top diagram of Fig. No. 3. This forms a passage under the bin which provides space for the installation of the aeration units and pneumatic pickup in the floor of the bin above. These same units are installed in the walls of the two adjacent bins. The lower half of Fig. No. 3 shows one of the bins extending down fully.

This bulk material is raked into the nozzle of the pneumatic pickup hose.

Fig. No. 4 shows the aeration units and pneumatic pickup at bottom of a storage bin. By blowing air into the compacted powder, it "fluffs up" and is then drawn by suction into the pneumatic system. The pickups for adjacent bins are inserted in the sidewalls shown in this picture.

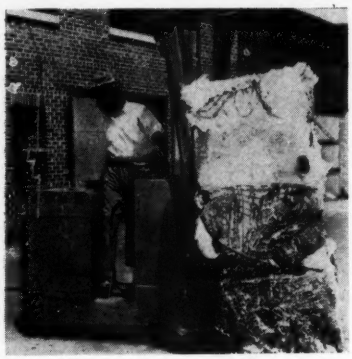
These pictures illustrate but sketchily

the extensive equipment and building alterations required to obtain pneumatic handling. By the end of 1949 the system was only partially installed. It is estimated that the final cost will be about $30,000. While the cost will probably be reduced $3,000 annually, the important achievements here are not the savings alone effected, but:

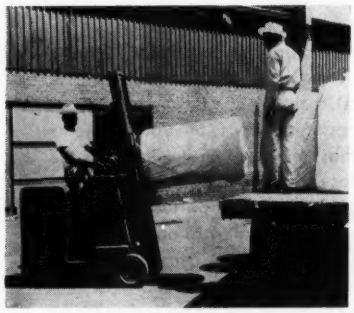
1. Reduced dust hazard. 2. Reduced slide danger. 3. Reduced contamination. 4. Speedier handling.

(See Mr. Hardy's "It Can Be Done More Easily", in this issue, which originally appeared in the same paper.—Ed.)

FORK TRUCK COST AMORTIZED IN 12 MONTHS—The use of fork trucks by the Joanna Cotton Mills Co., Joanna, S.C., so expedited the handling of cotton and other materials in warehousing and shipping that the cost of



at least one truck was repaid in one year of operations. This resulted in part through the ability of warehousemen to store cotton to the full capacity of the warehouse, thus averting the immediate construction of additional and costly warehouse structures. As shown in the photos, raw baled cotton and finished cotton in the form of cloth are handled by the vehicles. According to



the company, storage of baled cotton has been more than doubled within the same space since the fork trucks have been utilized. Some 80,000 lb. of starch are received each month and are handled in large load units instead of bag-by-bag. The trucks are also used in such maintenance operations as moving machinery.

—Courtesy, The Electric Industrial Truck Association.

*At E. W. Bliss Company it's FOUNDRY PATTERNS

...they're "ROUTINE" for ROSS Lift Trucks

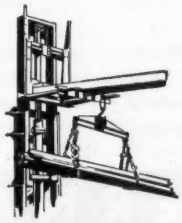
Handling this pattern for the bed of a 1,000-ton press would be a big job for ordinary equipment. Yet it's just "routine" with this ROSS Lift Truck which efficiently and safely transports patterns to and from storage at the E. W. Bliss Company's foundry in Toledo, Ohio.

If your plant is typical of most, handling jobs similar to this are a continual problem. That's where ROSS big-load handling efficiency can augment your present equipment, save man-hours and costly delays—very often enough to pay for itself in a year or less.

ROSS Lift Trucks are available in capacities from 5,000 to 18,000 pounds. All have gasoline power and are on pneumatic tires. Write today for complete details and performance data.

BOOM ATTACHMENT for ROSS Lift Trucks

Lift truck can be used as auxiliary crane. No interference with forks. Easily detached . . . Other attachments: scoop, ram, snowplow, winch, side-shifter, slope-piler, etc.



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. . . straddle the load . . . self-loading and unloading. Five types. Capacities, 10,000 to 40,000 pounds.

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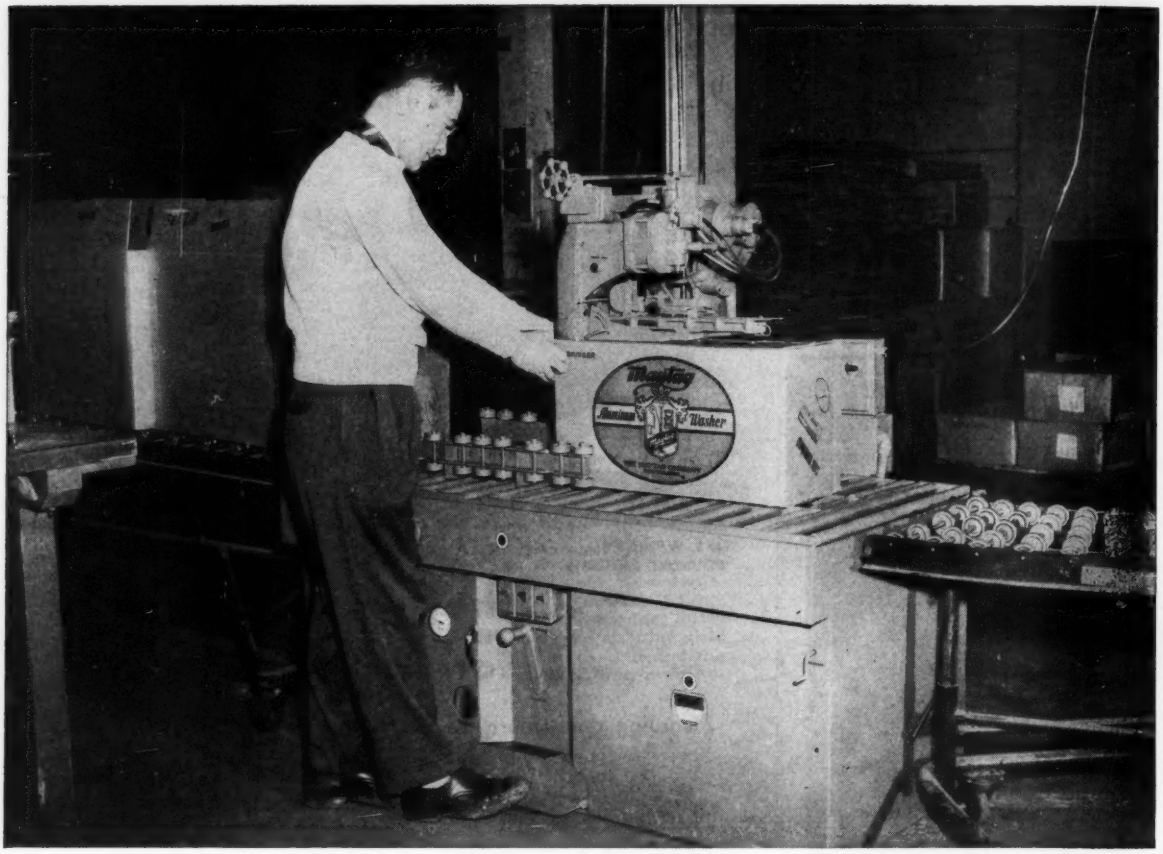
Direct Factory Branches and Distributors Throughout the World



WE'VE CONVINCED *Maytag*
NOW HOW ABOUT YOU?

● The Maytag Company is an old, well-established firm . . . never one to "go off the deep end" in any of its purchases. Take the International Retractable Anvil Staple Machine installation as an example . . . we had to back up our claims 100%!

We showed them that the Machine would close *filled* cartons *from the outside . . . tops and bottoms simultaneously*. Test shipments were made to prove that the closures were secure and that the cartons would arrive as fresh as they left.

They were referred to The Consolidated Freight Classification and Postal Regulations which approve our method of closure. It was arranged that

● they visit other nearby plants to see our machines in actual operation . . . and other installations were "brought" to them on our sound motion picture film.

It was pointed out that great savings would be effected in both space and time, since all cartons remain flat until ready for use, and in most cases no adjustment is necessary for closing cartons of variable size . . . and that one machine with one operator could close an entire plant's output.

May we also have the opportunity of proving to you that the International Retractable Anvil Staple Machine affords the finest, most secure and most economical method of closing cartons in the world today?

INTERNATIONAL STAPLE & MACHINE CO. HAVERTOWN PENNA. U.S.A. Retractable Anvil

EST. 1938

INTERNATIONAL STAPLE & MACHINE COMPANY

HAVERTOWN 16, PENNA.

Distributors in Principal Cities

Visit Booth 458—National Packaging Exposition, Chicago, April 24-27

PACKAGING MECHANICS SECTION

A regular monthly section in which are presented solutions to the problems of efficient filling and handling the boxes, cartons, bags, bottles, cases, etc., used in commerce and industry.

CONTENTS

A WIDER RANGE OF STOCK IN CONVENIENT CONTAINERS—at The Libbey-Owens-Ford Glass Co. Former methods presented limitations because of a bulky, hard-to-handle package. This photo report shows the present method which enables the company to ship in a matter of days. Keynote of the new operation is a "suspension" type interior packing used with a fiberboard container. A high-speed stapling machine is part of the equipment of special interest.. 62

FILLING POWDERED MATERIALS. How a leading manufacturer of animal pharmaceuticals modernized packaging operations in line with a plant-wide program. A higher production rate in less floor area and a better looking, more functional container were two important benefits. Necessary manual operations were likewise simplified. The company now ships almost 20,000,000 lb. of its products annually 64

How Libbey-Owens-Ford packages . . .

A Wider Range of S

LAST year, the Libbey-Owens-Ford Glass Co., Toledo, realized the necessity for providing its distributors and dealers with a wider range of stock in smaller, easy-to-handle containers.

FORMER METHODS

The company used to ship up to 50 lights (units of glass) of different sizes in company-made, heavy containers. Drawbacks were: 1. Too much time for box making. 2. Difficult handling for outlets because boxes often weighed several hundred lb. 3. Distributor-to-dealer shipments usually called for additional containers, which were usually secondhand; these increased individual handlings—contributed to breakage. 4. Inventory control was a problem because of many different sizes in one container.

PRESENT METHODS

Last fall, the company adopted a new method which used notched fiberboard retainers on the four corners of the load, the only interior packing necessary. The new method standardized on six lights of the same size in reusable fiberboard cartons.

Specific accomplishments are: 1. Production predicated on pre-determined inventory gives better control; orders can now be filled in 10 to 14 days instead of two to three months. 2. Reusable cartons facilitate faster, easier shipments by distributors. 3. Smaller, lighter containers simplify handling at the outlets. 4. More convenient storage and inventory control. 5. Lower, more complete inventories and faster turnover by some dealers. 6. Increased good-will reflected all along the line.

PACKAGING FEATURES

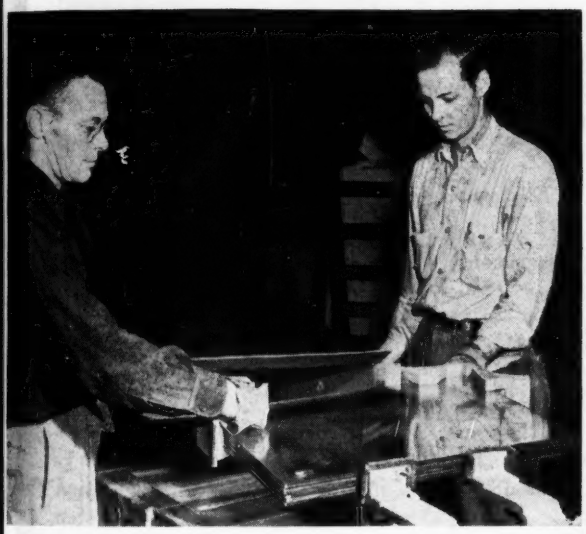
Special interior packing material placed around the four corners suspends the load within the container; glass fits into notches in the V-shaped extensions of the material. A high-speed stapling machine closes both ends of the carton si-

1 OVERHEAD CHAIN CONVEYOR with rectangular work carriers fitted with rubber-covered uprights transports glass to packing where . .

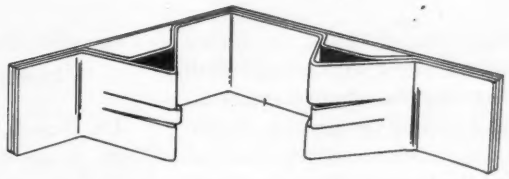
3 TWO OPERATORS work as team. Additional corner supports are added after carton is slipped around six lights. Next . . .

Stock in Convenient Containers

multaneously; its capacity can accommodate output of present and proposed packing stations. Tiering-type racks serve both as work carriers, transported by a fork truck, and as storage containers. Their tiering feature permits high stacking, easy inventory control.



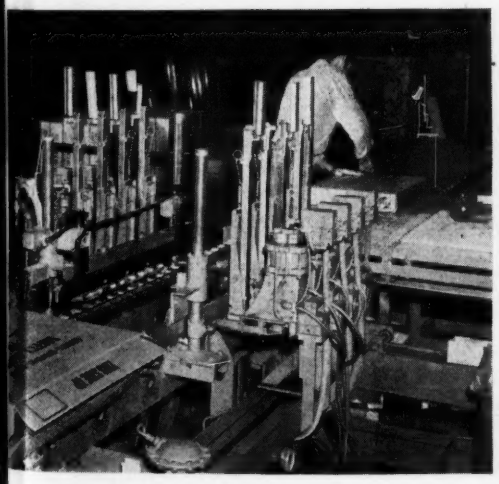
2 SUSPENSION PACKING material is wrapped around two corners. Wood flour replaces paper between lights. Usually . . .



▲ WIDTH OF notches is varied depending on thickness of load.

5 TIERING-TYPE RACKS serve as work carriers from packing, as containers in storage; permit stacking, easy inventory.

4 CARTONS FEED to stapling machine which closes both ends at the same time, has capacity for present, future needs.



Filling Powdered Materials

A higher production rate in less floor area—two important economies from a modernized packaging program at Dr. Hess & Clark, Inc. A better-looking, functional container was developed.

THE farms of 1950 are a far cry from those of 50 years ago. With the introduction of government laboratories and the growth of agricultural colleges, science has invaded the farms to the same extent as it has industry. A natural development in this trend were pharmaceuticals and manufactured food supplements for livestock and poultry.

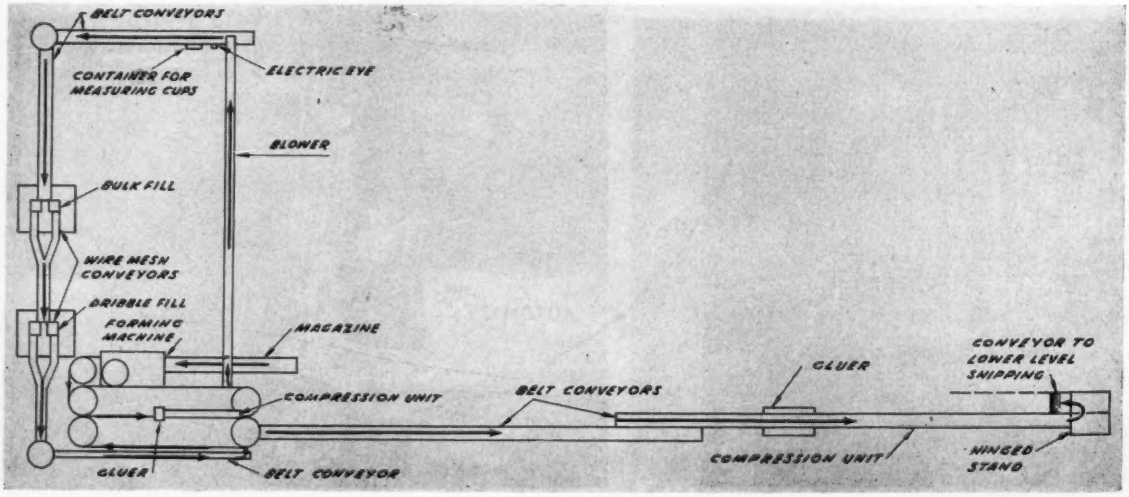
Automatic Packaging Equipment, Improved Container

Dr. Hess & Clark, Inc., Ashland, Ohio, is one of the world's largest manufacturers of pharmaceuticals for farm animals. In 1948, the company shipped approximately 19,400,000 lb. to more than 18,000 dealers.

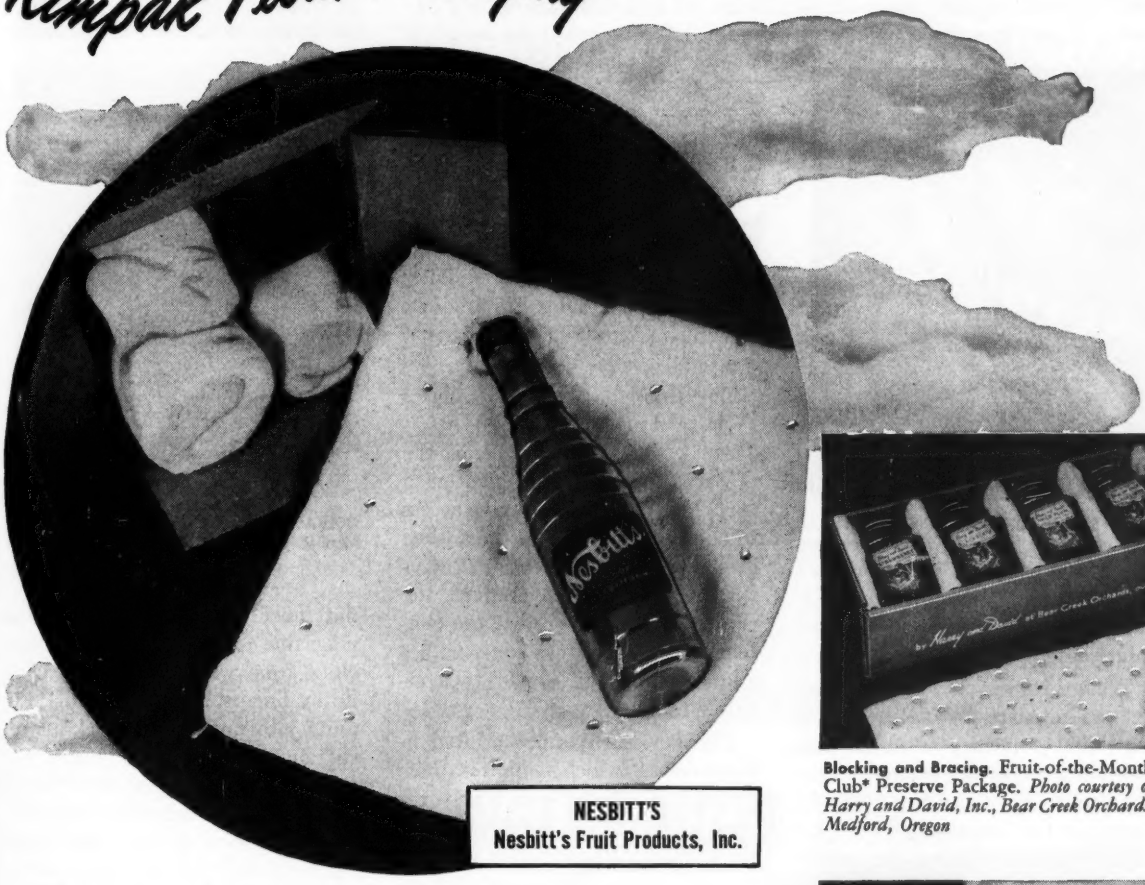
Within the past few years, the company has relocated storage areas and modernized its handling program, which increased production so markedly that it was necessary to change the existing packaging set-up.

The changeover included the installation of fully automatic packaging machinery and the adoption of new containers. The second step was made possible by the first—

U-SHAPED PACKAGING LINE fills and glues two sizes of cartons in one-half the former area.



Kimpak* Float Packaging



NESBITT'S
Nesbitt's Fruit Products, Inc.

Blocking and Bracing. Fruit-of-the-Month Club* Preserve Package. *Photo courtesy of Harry and David, Inc., Bear Creek Orchards, Medford, Oregon*

Blocking and Bracing. French Type Cheese Assortment. *Photo courtesy of Behle Bros. Co., Rolling Prairie, Wis.*

Cuts shipping costs— reduces damage in transit!

Does the product you ship enjoy maximum protection against weather and rough handling? Is your packaging operation fast, economical—up-to-date? Before answering, consider these facts about KIMPAK* creped wadding.

Unlike bulk packaging materials, the compact blanket form of KIMPAK is soft and clean. As quick and easy to apply as wrapping paper. Will absorb up to 16 times its own weight in moisture, within 30 seconds. KIMPAK is feather-light to reduce shipping weight; flexible—to conform to irregular surfaces; shock-absorbent—to guard against roughest handling.

Moreover, KIMPAK is neat and attractive-looking to add, rather than detract, from the appearance of your package. And there is a specification to meet every requirement of the Four Basic Methods of Interior Packaging: Bracing and Blocking, Flotation Packaging, Surface Protection, Absorbent Packaging.

Plan now to improve your packaging operation, and save money, too. For information, refer to your classified telephone directory under "Packing Materials" or "Packing Materials—Shipping"; or write directly to Kimberly-Clark Corporation, Neenah, Wisconsin.

FREE BOOKLET!

Kimberly-Clark Corporation
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Please send me free, the illustrated KIMPAK booklet "Float Packaging".

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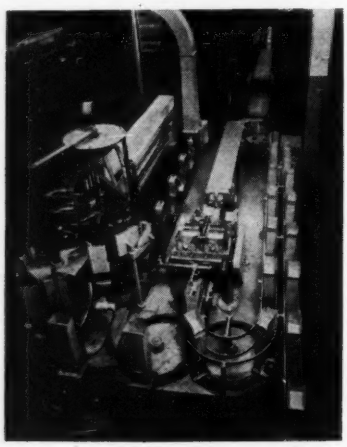
CREPED WADDING

*T. M. REG. U. S. PAT. OFF.

automatic packaging increased production per manhour to such an extent that the company was able to use a more expensive carton and



TWO SYNCHRONIZED CONVEYORS now feed one gluing unit. At rear, cartons are sealed and packed.

still maintain proportionate container cost.

While between 30 and 40 different products are packaged (including liquids, ointments, tablets and powders), this article examines only the packaging of the new three-lb. container for Pan-a-min. It is typical of the methods used for similar powdered tonic and mineral supplements.

Provision for Future Expansion

During the war, one shift packaged 54 hours per week. Even so, it was unable to keep up with the demand. The packaging was done largely by hand with the aid of some semi-automatic machinery.

The newly installed equipment is not only keeping up with production but also allows for future expansion. Specifically, the automatic equipment has done the following. 1. Substantially increased the packaging rate per manhour. 2. Increased packaging production has enabled the company to offer higher wages. 3. Reduced floor area, since two sizes of cartons can be packaged on one line. (Formerly this required two lines.) 4. The equipment gives a better sealed package. 5. The monetary savings from the automatic machinery has enabled the company to invest in a better looking, stronger container.

Detail of Container Design

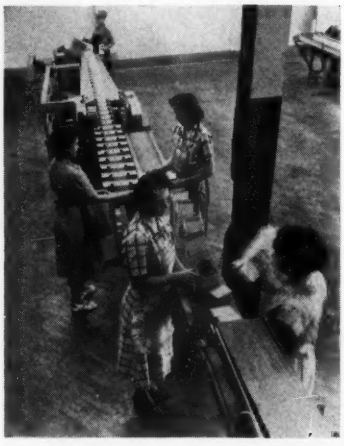
Because of the extremely fine powder, some sort of double container was always necessary to prevent sifting. The new carton consists of a chipboard shell or inner container which holds the product, and an outer container consisting of a printed coated board.

The three-lb. package measures $4\frac{1}{16}$" wide, $7\frac{3}{16}$" high and $2\frac{1}{2}$" deep. A scored line $1\frac{1}{2}$" from the top is cut by the user, creating a cap which is removed to give access to the inner unit. The inner shell is opened in the conventional manner. After using the product, the cap is replaced to protect the contents. This double container makes a functional, handy box for the consumer.

The new cartons are printed in three-colors, which enhances their eye-appeal. There is a family resemblance between all packages in the company's line (which was not the case before), with just enough distinction for easy identification of the various items.

Overhead Pneumatic Transfer System

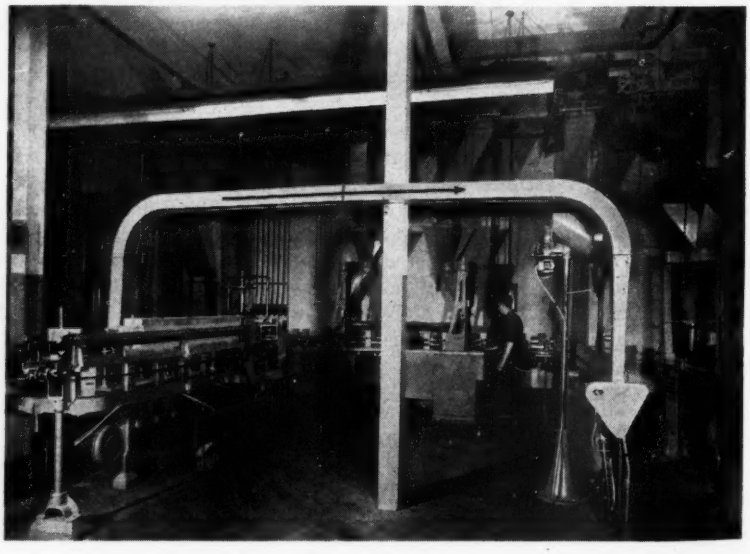
The "U"-shaped layout of the typical packaging line for boxes is shown on these pages. Normal production capacity is one filled package every second. One thousand



OPERATORS SLIP OUTER carton over shell. Manual operations were also studied for plant modernization.

flat inner shells are placed in the magazine feed of the forming machine from which they are picked up by fingers. The latter push the units into position for pick-off by suction cups. The containers are squared and dropped over forms which are chain mounted, then carried through a gluing unit where the inside top flaps are folded down and the outer flaps glued and pressed in place. A compression unit is next in line.

The shells travel beneath a "blow-over" device, a chute which arches some 15 ft. to the beginning



BLOW-OVER UNIT transfers cartons from gluing to filling line. Gates of Redler, rear.

of the filling line directly across from it. The air travels up through the hollow forms against the glued top of the container. The shells thus descend in an upright position on the filling line conveyor.

It was found that the light cartons did not always drop flush with the belt. To correct this, two eight-in. powered rollers, one at each side of the belt, were installed to exert pressure "in" and "down" to hold the units on the line until the belt could contact them.

The three-in.-wide rubber belt moves the shells past an electric eye which actuates a switch, discharging a small measuring cup from a hopper into the package. (This cup is used by the consumer.)

An Occupational Hazard Eliminated

The cartons travel about 20 ft., make a right-angle turn via a revolving disc and are delivered to the filling machine. The containers are alternately rammed onto one of two 3½" wide wire mesh belts. Mesh belts replace those of rubber during filling so that the dust can be collected. Hoods are also fitted over filling spouts to remove airborne powder. The network of collectors not only prevents discomfort to workers but also reduces product waste.

The filling machine hoppers are loaded from an overhead Redler conveyor, which delivers any one of several products from mixing stations on the first floor.

The first two-spout filling machine is cam-controlled and fills the cartons within three or four ounces of their total weight. After this "bulk" filling, the containers are diverted to a vibrating line which settles the powder to a true level. The cartons are again rammed onto one of two lines and are "dribble" filled to a predetermined weight.

Once again in single file, the units are turned 90 degrees by a revolving disc, and transferred to chain-

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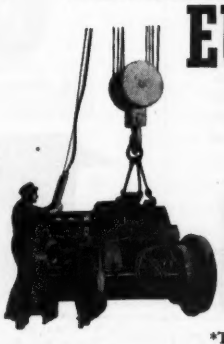

Spot-Positioning thru ease of accurate control is an outstanding performance feature of this 25 ton crane equipped with *E C & M Frequency Relay Dynamic Lowering Control. Non-overhauling loads with empty or slightly loaded hook start down slowly since weak "down power" is permissible. Euclid builds cranes in a range of styles and capacities to meet varied requirements.

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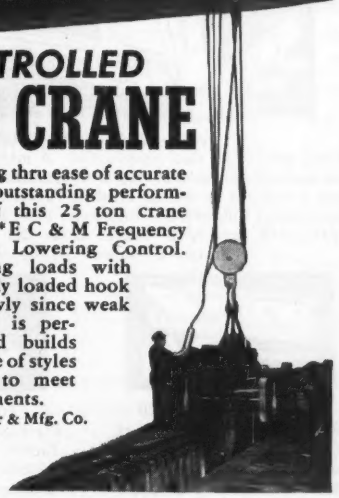

EUCLID CRANES AND HOISTS Raise Profits

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mounted stools or platforms which return the units to the gluing machine. By synchronizing both gluing conveyors, one machine is able to take care of the bottoms of the empty containers and the tops of the full ones. That the two lines feed alternately into the equipment may be seen from one of the photographs.

Manual Operations Simplified

As the closed containers leave the compression unit, operators slip the outer carton over the traveling shells. Time and motion studies have developed a simple and relatively effortless way of placing the outer carton. The operator merely drops the printed container over the inner one as it rides down the line. She then rolls the unit over on its bottom without lifting it from the belt.

It was found that operators, especially women, were easily fatigued when they had to lift containers weighing up to 10 lb. continuously during an eight-hour shift. The new method is not only faster, but is also done with a minimum of fatigue. The company was not merely satisfied with a study of better mechanical operations, but carried on the program to simplify necessary manual operations as well.

Other operators place the cartons on their side between chain-mounted dogs. In this position one of the top outside flaps is automatically coded and the top and bottom flaps glued simultaneously.

At the discharge end of the line, an operator assembles a knocked-down shipping container and inserts six to 24 individuals. The masters are placed on a 17" x 19" hinged stand with a roller bed. The stand is then dropped to a level position (providing an even surface with the belt conveyor which leads to first-floor shipping), and the units are advanced to the rough-surface rubber belt.

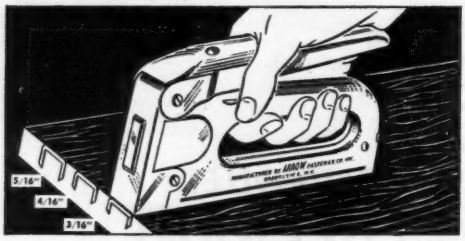
As the full containers travel on the inclined belt they break an electric eye circuit, which controls the movement of a second belt that travels to the shipping room. When the circuit is broken, the second belt moves only the length of one case. In this way, this conveyor also serves for intermediate storage.

The packaging line is only one of four in the packaging room. A second line, similar to the one described, is designated for five and 10-lb. square double containers; a third, for round fiberboard boxes with seamed tops, while the fourth is for canisters.

The set-up for one to three-lb. double containers is representative of the efficient packaging methods in this phase of the company's operations, which is merely one part of the plant-wide modernization program.

(For other reports on this company's operations, see "Batching By Engineered Bulk Flow," February, 40., Accumulation Center for Selective Sealing and Shipping, March, page 76.—Ed.)

STAPLE — to save time — speed up production



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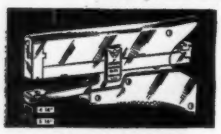

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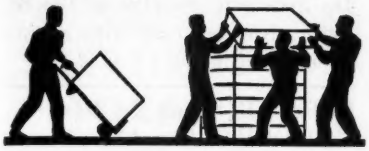
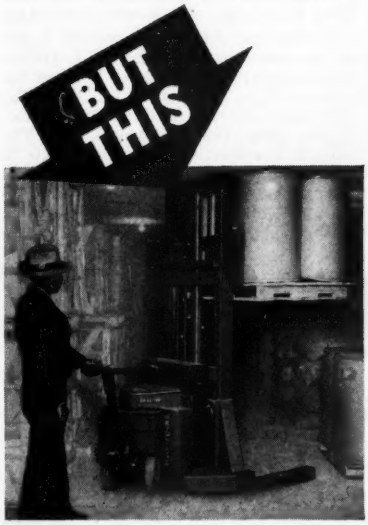


NOT THIS—NOR THIS



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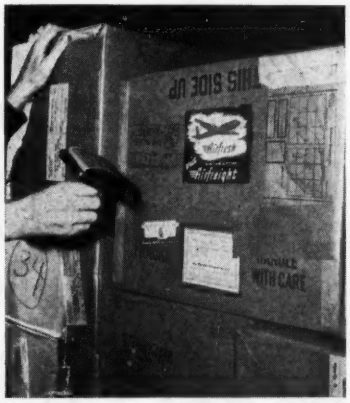
STENCILLING MINIMIZES LOSSES.—Many problems arise in the handling of air freight, some of which stem from marking requirements. Each package must be individually marked with information concerning its weight, lot, route, final destination, etc. Since this information must be quickly ascertained by handlers, it must follow some predetermined form. Markings must be clear and distinct and permanently affixed to the package so that there will be no danger of losses or delay due to lack of information. Until recently, gummed labels imprinted or typewritten with the desired information were first affixed to each package and then filled in by hand



with a pencil. Markings, in many cases, were indistinct and valuable time was lost in the double operation of affixing labels and laboriously marking them by hand. Occasionally, labels became torn or disfigured in shipment. Stencils now have been specially designed for American Airlines and prepared with its form die-impressed into the stencil. Accurate marking is effected by one man in a matter of seconds. Clerks fill in the form already on the stencil, affix the stencil to the duplicator, and stamp both form and information directly on the package in a single movement. Once the stencil is checked, all possibilities of human error are eliminated. Ink is self-fed from within the duplicator, thus making it possible for one man to stamp almost 1000 packages with a single stencil and only one inking as fast as he can touch each package. Since ink dries through a penetrating process, the marking becomes a permanent part of the material stamped.—Courtesy, Multistamp Co.

1949-1950

FLOW DIRECTORY

Copies of the new and revised Directory are available at $5 each. An invaluable manual for the material handling engineer, production executive, and purchasing agent.

Society, Association and Institute Chapter Activities

"ENGINEERING Old Plants for Material Handling" will be discussed by James E. Trask, Jr., Minnesota Mining & Mfg. Co., at the April 21 meeting of the Material Handling Society of Philadelphia. One of the major problems encountered by his company was the arranging of old buildings for modern handling methods to expedite rough and finished materials throughout the plant. The meeting will be held at the Poor Richard Club, 1319 Locust St., Philadelphia. The March get-together was highlighted by a talk by an executive of Barnum & Bailey-Ringling Bros. Circus, whose subject was "How The Circus Gets Around".

C. E. SMITH, Towmotor Corp., has been appointed chairman of the Show Committee of the Material Handling Institute, Inc. He replaces L. J. Kline who has left the industry. This action was taken at a recent board of directors meeting in Chicago. At the same time, the following were appointed committee chairmen: Budget & Finance, L. West Shea, Union Metal Mfg. Co.; Education, J. G. Bucuss, Acme Steel Co.; Planning, F. F. Seaman, Robbins & Myers, Inc.; Membership, R. K. Hanson, secretary-treasurer of the Institute; White Sulphur Springs Program Committee, H. A. Carter, Geneva Metal Wheel Co.

THE secretaries of the following associations recently attended an informal get-together in Pittsburgh. Joel Goldthwait, Association of Lift Truck & Portable Elevator Mfrs.; Harry P. Dolan, Caster and Floor Truck Mfrs. Association; R. C. Sollenberger, Conveyor Equipment Mfrs. Association; R. K. Hanson, The Material Handling

Institute; and C. J. Carney, Jr., Society of Industrial Packaging & Material Handling Engineers. Others who were unable to attend were Wm. Van C. Brandt, Jr., The Electric Industrial Truck Association; Montgomery Blake, Electric Overhead Crane Institute; and Herbert S. Blake, Jr., Power Crane & Shovel Association.

ROBERT C. BRADY has been appointed director of research of the Material Handling Institute. He will work with local chapters, trade associations, schools and regional material handling conferences in disseminating information on material handling. His office will be in the Institute's headquarters at 1108 Clark Bldg., Pittsburgh 22.

MEMBERS and guests at the February meeting of the Institute's Northeastern Ohio Chapter (Cleveland) heard Harry C. Morrison, Morrison Co., talk on the subject of the Material Handling Equipment Distributor's Viewpoint. After the talk, Frank C. Wier, Timken Roller Bearing Co., Canton, led a discussion on the respective viewpoints of the manufacturer, distributor and the user. A nominating committee for new officers was appointed.

FREIGHT loss and damage prevention was the topic of a roundtable discussion at the February meeting of the Michigan Division, Society of Industrial Packaging and Materials Handling Engineers, Detroit. H. E. Chapman, S. S. Kresge Co., guest chairman, reviewed the progress made by transportation companies in the reduction of damage claims during the past year. Chapman stated that better packaging materials and greater care by freight handlers contributed substantially to this reduction.

C. R. Ross, New York Central System, discussed the procedures used by the railroads in handling many varieties of freight, emphasizing the special care needed in loading less-carload freight. Better training programs for freight handlers and the use of conveyors and other modern freight handling equipment were said to be expediting and protecting freight shipments. T. W. O'Neill, George F. Alger Co., discussed human relationships in transportation. Harry G. Diefendorf and J. P. Kinney were honored by the National Society for their work contributing to the success of the Michigan Division of the Society. C. J. Carney, Jr., managing director of the Society, presented each with a testimonial certificate.

Gadsden E. Shand, Jr. Joins Material Handlers, Inc.

MATERIAL Handlers, Inc., 325 South Church St., Charlotte, N. C.: the firm has announced that Gadsden E. Shand, Jr., is now associated with the firm and will represent it and its manufacturers in South Carolina. Companies represented are Louden Machinery Co., Samuel Olson Mfg. Co., Towmotor Corp., A. B. Farquhar Co., Re-Bo Mfg. Co., Fairbanks Co., Plymouth Locomotive Co., and Jervis B. Webb Co.

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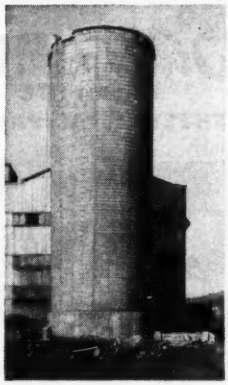

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The staves are formed under great pressure. They are dense in texture and have such high compression strength that superstructures are frequently built on top of N. & F. Bins without extra supports.

Shown in the photo is a 24-ft. dia x 60-ft. high N. & F. Bin erected for Speer Carbon Co., Punxsutawney, Pa. It is used for storing calcined coke. Capacity is 475 tons.

Before you reach any conclusions on vertical storage structures, be sure to get all the facts about N. & F. Bins. Complete information will be gladly sent upon request.

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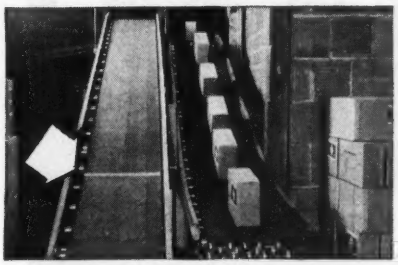

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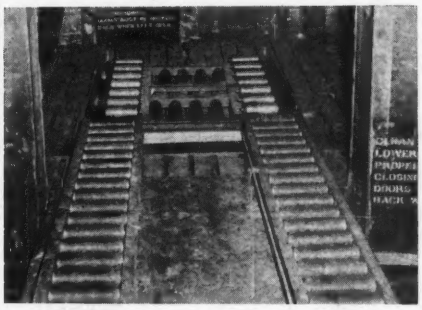

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Save TIME! *Save* SPACE!

HANDLING SHEET METAL PARTS!

Handle parts and materials faster, *and save space* with Donaldson's versatile TIER TRUCK. REDUCE HANDLING . . . roll parts right next to production machinery or assembly line . . . move them directly from tiered storage to next production operation. Self-aligning baskets . . . stack neatly and quickly to any practical height. Sturdy angle frame. Expanded metal basket permits clear view of contents. Two fixed and one swiveling caster for maneuverability.

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with SPEEDWAYS Roller Conveyors

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Easy portability, sturdy construction and simplicity of hook up that requires no tools are other features of both Speedways Wheel and SpeedTUBE *Roller* Conveyors. Available in 12", 15", and 18" standard widths, with wheel and roller spacing to meet your requirements, in 5' and 10' straight lengths and 45° and 90° curves, you can set up a material handling line to move your products. Write for literature and the name of your nearest Speedways representative.

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Represented and carried in stock by experienced material handling equipment engineers in principal cities. Also manufactured in Canada.

A regular feature designed to help the engineer and others responsible for material handling. The FLOW Engineering Data Page will cover a different category of equipment each month.

(From the 1949-50 FLOW Directory of Material Handling Equipment, Machinery and Accessories)

TO MAKE A MATERIAL HANDLING SURVEY

Every industry has handling problems, but in nearly every industry these problems can be reduced to some degree. Modern methods of material handling vary for each industry and each plant, and a specialized study is necessary to arrive at an efficient solution.

The following outline is given as a guide in the right directon when making a survey of your own operations.

Some one individual should be selected to head up the survey project. He can be an engineer who is already in your employ or he may be a consultant, from the outside, who specializes in surveys of this type.

The surveying engineer will begin by plotting a course of action. He will:

Establish the Scope

The first and most important step is to determine the extent to which management will respond to recommended changes.

Determine Physical Limits

The next step is to obtain or prepare a floor plan of the building. Fixed limits should be noted on this plan as they will govern the recommendations.

Anticipate Production

What, and how much will be handled? Estimates of production for the next 1 to 3 years should be procured from management.

Select Predominating Items

It is not reasonable to expect any one type of handling machinery to suit all demands. In almost every industry about 80 percent of the material handling work is expended on about 10 percent of the items or materials. Flow systems should be designed to handle all the major materials with the best suited equipment.

Estimate Cost of Present Handling Methods

An operation sheet, (charts), is filled in for the handling of each of the major items selected. This record will show the man hours expended on each piece or each load unit.

Apply the Principles of Efficient Handling

With the completed operation sheets, and other data, the enginer has a concise picture of his project. Examination of these data will show where the greatest man-hour or dollar savings can be effected and where changes in layout will eliminate some of the handling elements.

Prescribe the System

The system suggested by the enginer should be tailored to the handling requirements for the proposed production, to the physical features of the plant and to the investment limits prescribed by the management.

Report on the Survey

The men who must authorize the program of alterations and equipment installation will need to know the amount of expenditures involved, the estimated savings that will result and the time required to amortize the investment. Presentation of facts and reasons applied in formulating recommendations is best made in a formal report.

A survey that is well planned and executed can be completed at a nominal cost. Even though the survey recommendations are not acted upon in full, one or more of the findings may bring about savings in excess of the survey cost.

PRESENT METHOD (Hand Trucking)	Distance in feet	No. units moved	No. persons engaged	Elapsed time in hours
Move stake truck into highway truck body	50	—	1	.017
Place packages on stake truck	—	60	1	.100
Move stake truck to scale	50	60	1	.017
Weigh load	—	60	1	.017
Move stake truck to stores area	100	60	1	.033
Unload packages and place in stack	—	60	1	.100
Return truck	100	—	1	.033
Move stake truck to stores area	100	—	1	.033
Load packages on stake truck	—	60	1	.100
Move truck to processing area	400	60	1	.100
Unload packages and stack	—	60	1	.100
Return truck	400	—	1	.100
				.750

$$\frac{.750}{60} = .125 \text{ Man-hours per package}$$

Employee's hourly rate:

$1.40 + 10% payroll overhead = $1.54 per man-hour

$1.54 × .125 = $.1925 per package

Monthly receipts = 980 packages

980 × $.1925 = $188.65 handling cost per month

PROPOSED METHOD (Fork Truck & Pallets)	Distance in feet	No. units moved	No. persons engaged	Elapsed time in hours
Move pallet by fork truck to highway truck	50	—	1	.017
Place packages on pallet	—	60	1	.100
Move pallet to scale	50	60	1	.017
Set pallet on scale platform	—	60	1	.001
Weigh load	—	60	1	.017
Pick up pallet from scale	—	60	1	.001
Move pallet to stores area	100	60	1	.025
Set pallet on floor	—	60	1	.001
Return truck	100	—	1	.025
Move truck to stores area	100	—	1	.025
Pick up pallet	—	60	1	.001
Move pallet by fork truck to processing area	400	60	1	.075
Set pallet on floor	—	60	1	.001
Return fork truck	400	—	1	.075
				.381

$$\frac{.381}{60} = .0635 \text{ Man-hours per package}$$

Employee's hourly rate $1.40 + 10% payroll overhead = $1.54 per man-hour

$1.54 × .0635 = $.098 per package

Monthly Receipts = 980 packages

980 × $.098 = $96.04 handling cost per month.

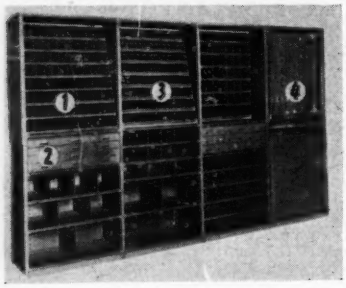
$188.65 (present method) — $96.04 (proposed method) = $92.61 monthly savings on this item. To be applied, with the savings from other items, against the operating cost and amortization of the fork truck and pallets, to obtain the monthly net savings.

NEW PRODUCTS

For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13, or use postcard bound into this issue.

STORAGE EQUIPMENT

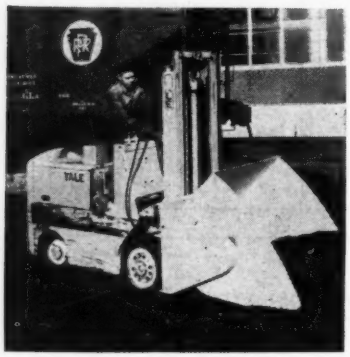
NP1—A line of storage equipment for tool and stock rooms has been developed by Lyon Metal Products, Inc. Shown are four types. 1. Sloping front model which has 88 openings in eight depths with shelf dividers adjustable on one-in.



centers. It is designed for small tools and supplies. 2. Drawer case model; each drawer has five dividers. It is designed for small tools and cutters supplies. 3. Sloping shelf unit which has 108 compartments on eight shelves. It may be used for storing drills, reamers and taps. 4. Swinging panel model which contains approximately 27 sq. ft. of storage area. Holes are on one-in. centers. This is designed for milling cutters, gauges and templates.

HYDRAULIC SCOOP-SHOVEL

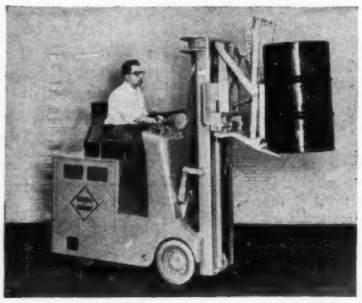
NP2—The Yale & Towne Mfg. Co. has announced an hydraulically-operated Scoop-Shovel designed for scooping, lifting, moving, and dumping sand, coal,



gravel, grain, dry chemicals and similar bulk materials. This accessory is attached to the company's line of electric and gas fork trucks for operation within the plant, in the yard, and in box cars and highway truck-trailers. The scoop handles up to 27 cu. ft. of material. It tilts upward from the horizontal scooping position to cradle the load during transport, and tilts downward to discharge the load completely when dumping. The device scoops at the ground level or digs into piled material. It loads bins, vats, hoppers, mixers, and other receptacles at heights up to 130 ins.

FOR HANDLING DRUM PRODUCTS

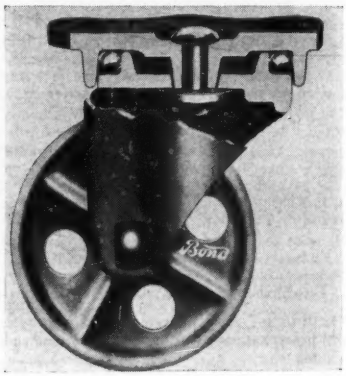
NP3—Designed for lifting, transporting and stacking various forms of drums and drum products is a power truck device developed by The Elwell-Parker Electric Co. It may be used by manufacturers and distributors of steel drums and those handling large quantities of oils, paints and other liquids and chemicals. The device comprises a steel frame with base attached to an elevating mechanism in a truck's upright column. It is not wider than a standard



size 55-gallon oil drum. The single unit's handling capacity is 1000 lb. In the center of the forward upper cross member is an adjustable hook. In operation this hook engages the upper chime or rim of the drum, enabling the truck driver to tilt it backward. At the bottom of the frame are two short forks. These are beveled and each has a groove conforming to the circular contour of a drum. As the drum is tilted backward and the truck moves forward, the forks slide under the raised portion, and the lower chime slips into the grooves. One length of flexible cable and take-up reel mounted on the truck's driving panel governs the position of the hook in holding or releasing the barrel. A vehicle so equipped can lift a drum to a base height of 130 ins.

SWIVEL CASTERS

NP4—The Bond 3-A Series Single Ball Race Swivel Caster, manufactured by Bond Foundry & Machine Co., has been re-designed. Added strength enables the caster to withstand greater impact



shock and is extra insurance against breakage, it is said. The possibility of material clogging in the sides of the caster has been reduced by increasing the space between wheel and fork. Large-diameter ball race is designed to carry the load adequately and absorb side thrusts. The 3-A Series casters are available with plain or roller-bearing semi-steel wheels; self-lubricating bushed or roller bearing solid rubber wheels; and with or without thread guards. Wheel sizes range from a two-in.-diameter to a six-in.-diameter.

BUCKET LOADER

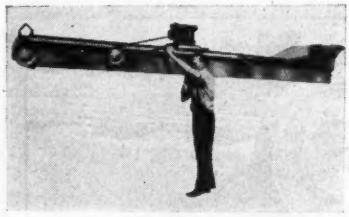
NP5—Newest addition to the Barber-Greene Co.'s line of portable Constant Flow material handling equipment, is a pneumatic-tired Model 543 Bucket Loader. One feature, for those who have widely scattered stockpiles, is the 15 M.P.H. road speed. Two forward and two reverse speeds allow operator to compensate for load and power requirements. Another feature of the model is automatic load trimming possible with the power hydraulic controlled swivel loading conveyor. Swivel conveyor is available in either 13′ 7″ or 16′ 7″ lengths. It loads trucks, trailers, railroad cars, etc. with a minimum of spotting effort. It handles capacities of up to three cu. yds. per minute and handles bulk materials, such as crushed stone, gravel, sand, cinders, black dirt, fertilizer, chemicals, etc. The power-hydraulic raising and lowering of the elevating boom controls the level of the feeding spirals and the follow-up scraper.

BELT FEEDER

NP6—A compact, totally enclosed, fully accessible belt feeder for installation in crowded places has been developed by the Richardson Scale Co. Designed to deliver a continuous stream of material from an intermittently discharging automatic bulk scale, it has a wide range of applications as a feeder or "take-away" conveyor. A variable speed drive can be furnished which is automatically adjustable to vary the stream in conformity with the timed discharges of the automatic scale above, and so maintain a continuous, accurately weighted stream. It also features cantilever pulleys for endless belting and removable skirt plates. It is available in lengths of from 18 to 60 ins., and in stream widths of two, four and six ins. with a rated capacity up to 1500 cu. ft. per hour. Belt speeds up to 200 ft. per minute. It can be driven by a single speed motor at either end from line shaft or by special variable speed drive when specified. Manual control, or a special remote control up to 30 starts per minute, is also available.

PORTABLE BULK CONVEYOR

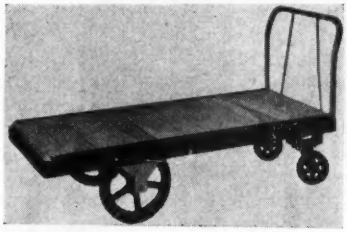
NP7—The Handy-Handler, a lightweight general-purpose industrial conveyor is being produced by the Belt Corp. This portable model is designed to deliver stoker coal, salt, gravel, sand



and similar bulk materials. Constructed of aluminum alloy, it may be carried and positioned by one man. The lightest of several available models weighs 119 lb. Equipped with a two-HP gasoline engine, it is designed for loading trucks, storage bins, filling hoppers and furnaces and performing like tasks. The conveyor is available in lengths from 10 to 20 ft. Standard 16-ft. models may be increased to 20 ft. by inserting a midsection. Models are available with choice of three electric motors and three gasoline engines. Rubber flights and continuous rubber belt or steel flights and chain are offered.

PLATFORM TRUCK

NP8—A combination steel frame and hardwood-deck platform truck has been added to the material handling equipment line of The Rapids-Standard Co., Inc. Arc-welded frames on the truck are 3⅛ ins. deep, of 10-gauge formed channel steel. A steel angle reinforcement runs the entire length of the deck for added strength and rigidity. Push handle sockets are inset-welded, forming rounded corners without sharp angles or projections. Decks, in sizes from 24 x 48 to 36 x 72 ins., are of $\frac{13}{16}$ in. dressed paraffin oil-treated hardwood. The vehicles are available in tilt or level types, with capacities up to two



tons, depending on running gear. Most models offer a choice of plastic, molded-on rubber, or steel wheels in a wide range of sizes. Casters are either cold-forged or steel-forged, with all swivel casters of double raceway construction. Load wheels come equipped with roller bearings and pressure grease gun lubrication fittings.

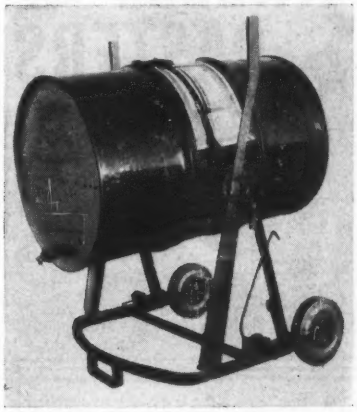
THIRD-WHEEL HAND TRUCK

NP9—One feature of the Food-Trucker, a hand truck manufactured by Melooz Mfg. Co., is an instantly adjustable third-wheel support, which is also used as a lever in breaking over heavy loads. Thus, the operator steps on the end of

the leverage plate, automatically bringing the load down to wheeling position. The tripod support is adjustable through a wide range of balance positions, for maximum ease of wheeling. It can also be folded completely out of the way whenever desired, to permit use of the truck as a two-wheeler. Since the tripod support carries and balances the entire weight of the load, it is ideal for handling merchandise in crowded stores, through narrow aisles, on slippery floors, through swinging doors, in and out of elevators. Another feature is the Flexi-Metal Pallet which works in conjunction with the truck, though it can be used alone. The truck slides instantly into the pallet slot and picks up an entire load as a single unit.

PORTABLE DRUM RACK

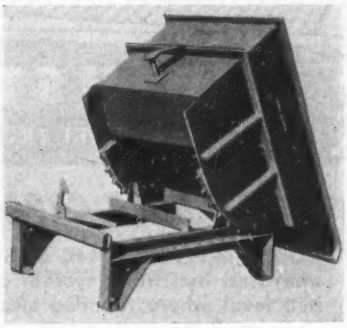
NP10—This Tilting Portable Drum Rack is all steel welded with a cradle and clamp adjustable for 50 to 55 gal-



lon drums. It is offered by The Penco Eng. Co. Equipped with rubber-tired wheels. Height from floor to spigot with drum in horizontal position is 18 ins.; overall height with drum upright is 45 ins. Floor space required with drum in horizontal position is 31 ins. by 35 ins. Total weight (without drum) is 72 lb. In lifting and transporting, the center of gravity is almost directly over the wheels, allowing sufficient weight on the handles for the operator to keep a full load under control at all times. Rubber tired wheels are designed for increased maneuverability. The rack may be locked in any position.

HEAVY DUTY SELF-DUMPING HOPPER

NP11—Roura Iron Works, Inc. has developed a line of one-yd.-capacity heavy-duty Self-Dumping Hoppers. The hopper bodies are built of ½" plate



throughout; they are specially designed to withstand warping when handling red hot sprues and castings. The hoppers are built to fit any standard type lift truck and can be unloaded by the operator by lifting the release handle. Other standard hoppers manufactured by the company come in ½, ¾, 1, 1½ and 2 cu.-yd. sizes. They can also be designed for flat trucks and with special flanges to permit stacking.

A Complete Line of
INDUSTRIAL
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- For original equipment or replacement.
- Sizes and types to fit your needs, roller bearings optional.
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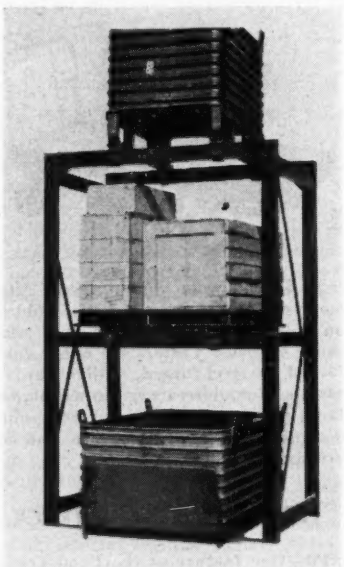
ADJUSTABLE ALL-STEEL STORAGE RACK

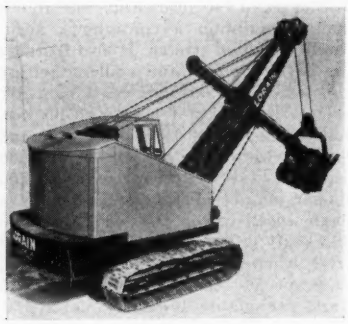
NP12—An adjustable storage rack for platform boxes and pallets has been developed by Palmer-Shile Co. Storage



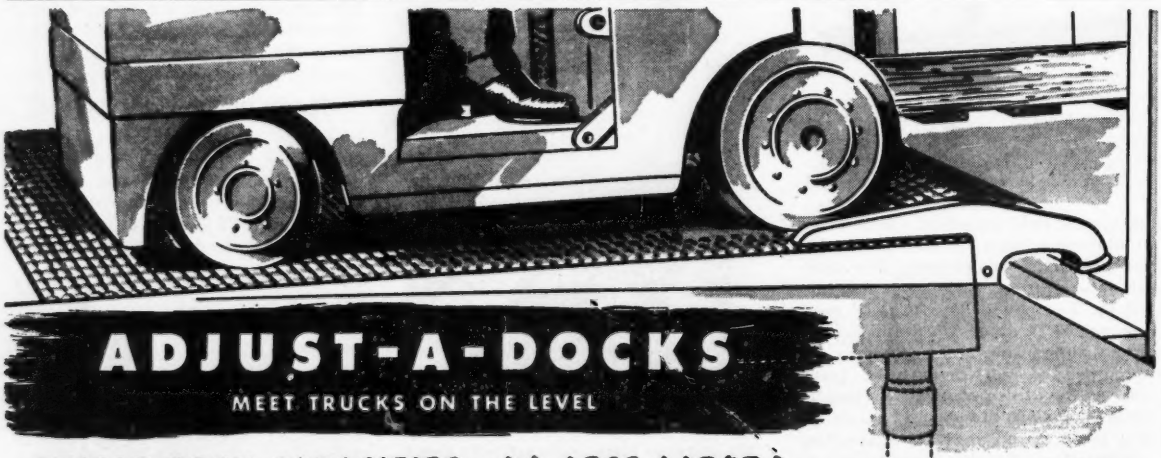
of several boxes or pallets of various sizes is made possible by adjustable tracks which may be moved up or down as required. This is designed as a safety measure in the storage of uneven loads. Track channel runners are adjustable to any width. Units are manufactured to required dimensions. Paint and number of track and runners may be specified.

CRAWLER-MOUNTED CRANE

NP13—A crawler-mounted crane in the ¾-yd. class, the Lorain TL-25, is available from The Thew Shovel Co. The crane offers such features as electric starter and operating lights; five identical clutches to control all machine



operations; one-piece, all-welded turntable bed; and hock rollers mounted on drop-forged brackets with centralized pressure lubrications. Other features include machine-cut internal ring gear; oil-enclosed, machine cut gears throughout except for two intermittently-used gears; anti-friction bearings on all horizontal power shafting and clutch fric-



ADJUST-A-DOCKS
MEET TRUCKS ON THE LEVEL

TRIPLE DOCK CAPACITIES with LESS LABOR!

RUGGED HYDRAULIC SYSTEM. Push button control of the motor-operated hydraulic system quickly brings the floating dock to truck bed level where rounded steel arms float the dock at truck level.

AUTOMATICALLY SAFE. Limit switch automatic control prevents even a loaded Adjust-A-Dock from dropping if truck should move away. When not in use, Adjust-A-Docks are leveled with dock floor and sustain loads up to 400 pounds per square foot.

EASILY INSTALLED. Adjust-A-Dock installations, designed to withstand weather, are made completely above ground and have a 100% salvage value in event they are moved.

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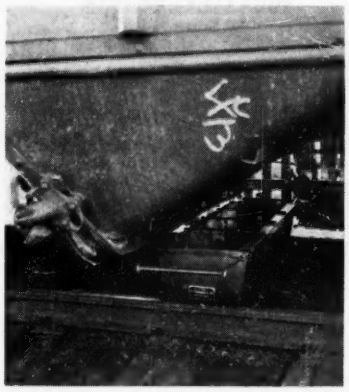
ADJUST-A-DOCK users have reported important savings in dock space, loading time, labor, handling time and damage. These savings, in many cases, paid for their entire Adjust-A-Dock installations in less than 30 days.

WRITE FOR COMPLETE INFORMATION ON ALL MODELS NO OBLIGATION, OF COURSE.

tion drums; power load lowering. The front end boom equipment is interchangeable. Speed changes are controlled through a two-speed transmission mounted integrally with the turntable engine. In addition to the standard two-speed crawler, there is an extra long crawler designed for dragline, clamshell and crane work. The third crawler is a wide-gauge crawler with an overall width of 11'8" and a clear span between treads of 8'.

DE-ICER

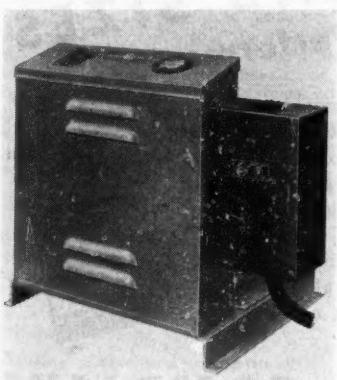
NP14—To expedite the unloading of frozen coal or similar material in steel railroad cars, the De-Icer, manufactured by J. C. Corrigan Co., Inc., is placed under the car pocket where it snaps to the rails. Fuel consumption is said to



be low. At one end of the unit a rag partly submerged in the oil, when ignited, produces a lazy flame which distributes heat along the entire width of the hopper doors, producing an easy flow of coal. It is further stated that the De-Icer will not damage railroad cars on rails.

BATTERY CHARGER ACCESSORY

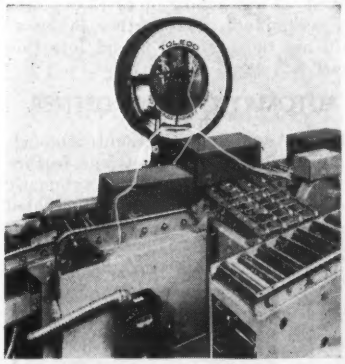
NP15—The Hertner Electric Co. has announced an addition to its line of battery charging equipment. Known as



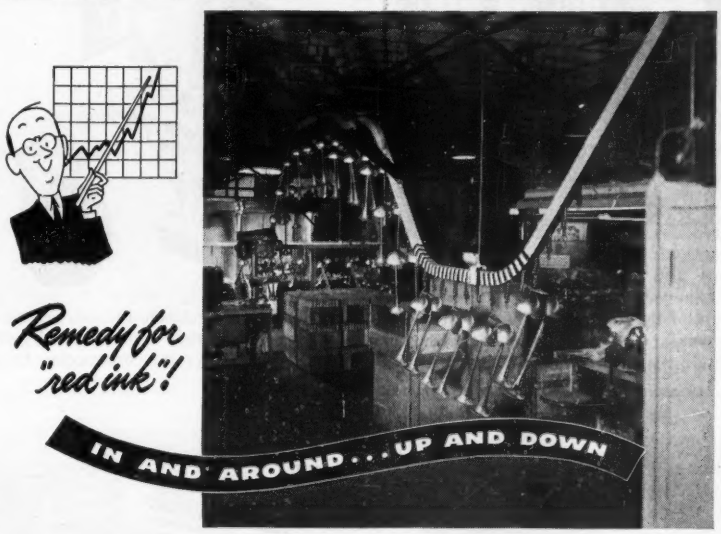
the Double Duty Charge Control, it is an accessory for automatically charging two batteries from a Hertner single-circuit motor generator battery charger. It is suited for installations where two like batteries are to be charged overnight. The accessory is housed in a compact steel box mounted on the charger control cabinet.

CLASSIFYING SCALE

NP16—An automatic weight classifying scale for checking cases, cartons and other containers has been announced by the Toledo Scale Co. When installed in a conveyor system, it will determine if filled containers are within a predetermined weight tolerance. It also checks whether each unit in the case is full measure and if a case contains the proper number of units. The scale can be adapted to either automatically reject "off-weight" cartons onto a sep-



arate conveyor or stop the main con-

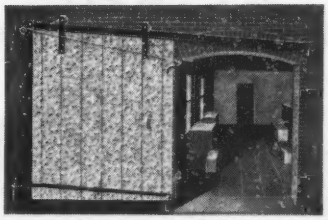


R-W "ZIG-ZAG" continuous power conveyors raise productivity . . . lower costs

In almost every imaginable industry, R-W Zig-Zag Conveyors are serving production and processing lines—increasing efficiency, cutting costs. Specifically designed to carry light loads through confined, crowded areas, Zig-Zag breaks costly "bottle-necks," and helps put production on a more profitable basis.

"ZIG-ZAG" Pays for Itself

Our files are filled with evidence which proves conclusively that the savings effected with R-W Zig-Zag Conveyors are so substantial the equipment quickly pays for itself —in most cases in *less than a year!* So, to put your plant in position for peak profits, convert now to Zig-Zag—the modern method for continuous overhead transportation and processing of materials. For complete details—all the facts about R-W Zig-Zag Conveyors, contact the nearest office of Richards-Wilcox.



R-W No. 2102 Hardware with No. 647 labeled "FyeR-Ward" flat surface steel door.

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"A RANGER FOR ANY DOOR THAT SLIDES"
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SLIDING DOOR HANGERS & TRACK • FIRE DOORS & FIXTURES • GARAGE DOORS & EQUIPMENT
INDUSTRIAL CONVEYORS & CRANES • SCHOOL WARDROBES & PARTITIONS

veyor until the case is manually removed. It will handle up to 15 containers per minute. For further information, use the postcard bound into this issue.

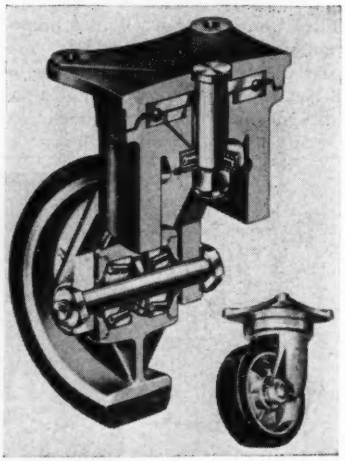
AUTOMATIC DOOR OPENER

NP17—Adaptability without remodeling existing installations is one feature of Astra Engineering Co's. automatic door-opening device. It is air-operated

and hydraulically controlled. The opening and closing action is automatic whenever an operator walks on either side of the doors. The floor plate which governs action is $\frac{3}{16}$" thick with low-angle rising edges for smooth approach of foot traffic and vehicles. When building air supply is not available, air may be supplied by a small compressor. Use the postcard bound into this issue for complete information.

CASTERS AND WHEELS

NP18—Aerol Co., Inc., is offering a range of heavy-duty industrial trailer wheels and casters which were developed primarily for use on power towed

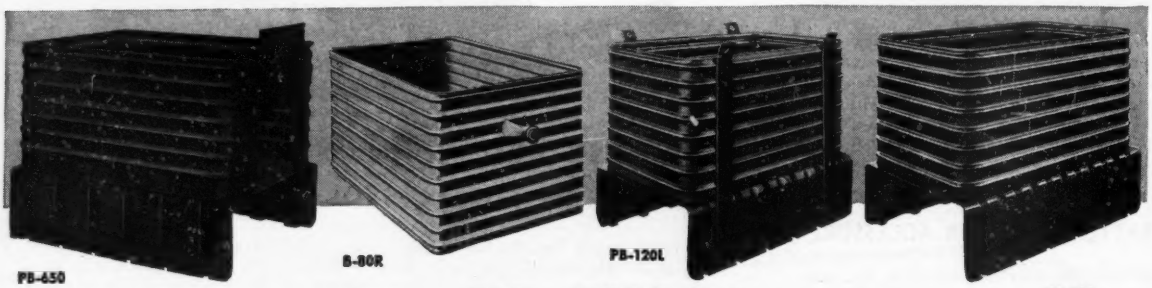


equipment. Available in both rigid and swivel types, they are cast of prime aluminum alloy and constructed to reduce clutch wear, battery strain, and mechanical fatigue on power towing equipment. Other features include sensitive swiveling action; lifetime, sealed-in lubrication; and a permanently adjusted king-pin of 1¼-in. chrome molybdenum steel. It is further stated that tread will not chip, gouge, or adopt a permanent set. Heavy-duty industrial wheels are permanently sealed and lubricated. According to the release, condensation will not form in the air-tight, water-tight wheel hubs or swivel caster rigs, nor will steam under pressure or developed vacuum disturb or destroy the sealing features. Casters and wheels are available in four different mountings: caster mount, inside mount, outside mount and stub axle outside mount.

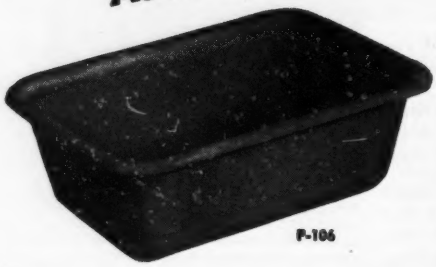
CIRCLE NUMBERS ON THE CARD AND MAIL!

AIR-OPERATED DRUM FILLER

NP19—Designed for filling drums with liquids is an air-operated device manufactured by The Yale & Towne Mfg. Co. Typical liquids handled by the mechanism include oils, paints, varnishes, chemicals, syrups, and food products. Mounted on a Yale Load King Scale the device operates as follows. An empty drum is placed on the scale platform. A tare beam poise is moved until the dial



WIDE RANGE OF TYPES AND SIZES
Assures Efficient Truscon Steel Box Performance



● The need of your particular materials handling and storage operations can be met efficiently with one or more types from the many Truscon Steel Box and Skid models. These can be used for a wide range of parts or finished products, for quick, labor-saving movement by hand- or power-lift trucks or cranes. Let us give you the benefit of our experience in making materials handling and storage easier and more economical for you. Write for illustrated catalog on Truscon Steel Boxes and Platform Skids.

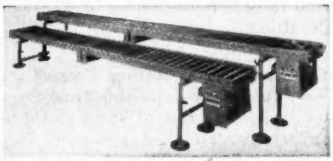
Standard Tote Box—One-piece drawn steel box manufactured from 16 gauge cold rolled steel. Used in handling miscellaneous small parts. Boxes are so designed that nesting is practical and easy. Dimensions: 12" x 18" x 6¼".

TRUSCON STEEL COMPANY
PRESSED STEEL DIVISION • 6202 TRUSCON AVENUE • CLEVELAND 4, OHIO
SUBSIDIARY OF REPUBLIC STEEL CORPORATION

indicator points to the net weight of material desired. The valve assembly is lowered (by air) to the drum bung-hole. The start button is pushed, starting the flow of liquid which automatically cuts off when the desired weight is reached. All that is required to operate the scale is an air line, pressure between 80 and 150 lb., preferably 100 lb. The device fills a 52-gallon drum with SAE 30 oil at 95 F in 49 seconds. The flow of material can be regulated to suit the material and the operation. Accuracy is provided, for example 442 lb. of SAE 30 oil can be filled within six ounces.

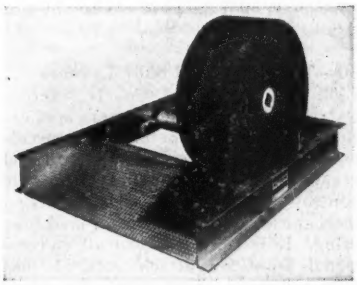
CONVEYORS AND DOLLIES

NP20—Metzgar Co. is offering live roller conveyors for handling hot products or those with sharp edges. Rollers with widths of 11½", 15", 18" and 24" are spaced on various centers. Conveyors are mounted on adjustable permanent bases or adjustable portable base stands. They are said to be able to convey certain items up a 10-degree incline or hold them on decline.



Another type of conveyor manufactured by the company is a power belt section known as the Power Helper. It is made in 12" or 16" widths, with boom lengths of 10' and 15'. The adjustable head section contains five rollers. Horizontal height is adjustable from 31" to 36" and the maximum discharge height on the 10-ft. machine is 84".

Steel cable reel dollies are available in two and four-ton capacities. Both models are supplied with a ramp of heavy floor plate steel and both have rear wheels adjustable to accommodate rolls with diameters from 20" to 8'. They are designed for handling wire, cable, rope, belting, fence, carpeting and other rolled fabrics.



MATERIALS HANDLING ENGINEERING

Our *22 Years'* **Experience** Saves You **Time & Money** and takes the **Guesswork** out of your **Materials Handling** program.

Write or phone us for further information without obligation.

Gemar Associates
Consulting
MATERIALS HANDLING ENGINEERS
Greenwich, Connecticut
Phone 8-6766

NO SPRINGS TO BREAK in the Nutting JACK it's ALWAYS Dependable

The Nutting Jack is the ONLY jack operated entirely by gravity and leverage. With no springs to break, there is no danger of your whole jack-skid system suddenly being put out of service.

One lift truck and two dead skids cost about the same as *two Nutting Jacks and twelve semi-live skids.* That's one reason why the Nutting Jack and Skid system can be such a money-saver in your plant. Material stored on semi-live skids is made mobile in a hurry. The jack may be coupled to one skid, then uncoupled and coupled to another faster than the time it takes to tell about it.

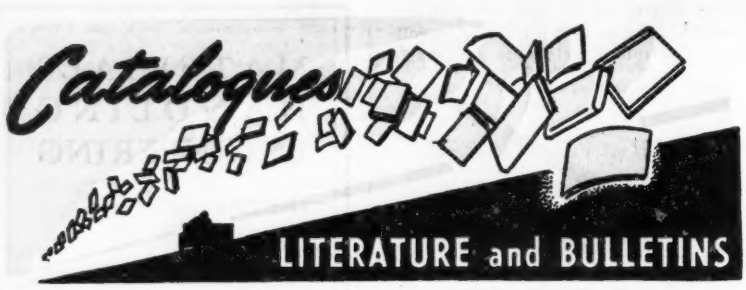
Send For Bulletin 48-JS

Look in your classified phone directory for your Nutting representative, or write for Bulletin 48-JS. It will pay you to get *all* the facts on this superior Nutting Jack-Skid handling system.

Nutting makes everything in floor trucks, wheels, casters

FINGER BAR
Controls Load and Tongue
BALL BEARING SOCKET BLOCK
Provides perfect swiveling, short turns, high lift
ROLLER BEARING WHEELS
For smooth, effortless handling

our 59th Year NUTTING TRUCK and CASTER COMPANY
1604 DIVISION STREET • FARIBAULT, MINNESOTA



The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

25—Floor Trucks . . . A 64-page catalog by Thomas Truck and Caster Co. on its line of floor trucks, casters and wheels. Profusely illustrated, the publication covers various types of platform trucks, superstructures, semi-live skids, wagon trucks, two-wheel trucks and pry trucks. Other types described are dollies, trailers, casters and wheels. Several hundred photos, specifications, charts and operating data. A worthwhile publication for plant libraries.

26—Protective Packaging . . . The Kimberly-Clark Corp. is offering a booklet entitled "Float Packaging". It covers the principal uses for Kimpak, a creped wadding for protective cushioning in interior packaging. For further information use the postcard bound into this issue.

27—Hydraulic Hoist . . . A brochure from Unit Mfg. Co. illustrates and describes its Utility Hoist, an hydraulically-operated hoist which may be placed on various types of castered carriers, or used as a permanent installation on shipping docks or highway vehicles. It is designed for engine and die removal and installation, loading and unloading trucks, moving and relocating small machinery, lifting, stacking and tiering, and degreasing operations. The hoist has a ¾-ton capacity, with full swivel action. Use the postcard to obtain your copy.

28—Classifying Scale . . . The Toledo Scale Co. will send information on its automatic weight classifying scale for checking cases, cartons and containers. The equipment is installed in a conveyor system and determines if filled containers are within a predetermined weight tolerance. It is also designed to check if a carton contains the proper number of units, and whether each unit in the case is full measure. It can either automatically reject containers with incorrect weights onto a separate conveyor or stop the main conveyor until the case is manually removed from the scale.

29—Lift Trucks and Skid Platforms . . . Bulletin No. 26, released by Lewis-Shepard Products, Inc., gives information on its line of hand lift trucks and skid platforms. Specifications and engineering features of trucks with capacities from 500 to 15,000 lb. and more are included. Installation photos. For your copy, mail the postcard bound into this issue.

30—Truck-Mounted Shovel Cranes . . . Link-Belt Speeder Corp. is offering Catalog No. 2322 which covers applications, construction details and specifications of HC-51, truck-mounted shovel crane. The model features hydraulic controls, and front drum reversing mechanism for power control load lowering. It is convertible to all conventional front-end attachments. It has a travel speed of 37 MPH, 10 speeds forward, two reverse, and walking beam support on rear axles designed so rear wheels can follow uneven terrain and equalize roads. Lifting capacity is 12½ tons.

31—Batteries . . . Modern Material Handling For Close Quarters and Light Floor Loadings is the title of a booklet available from Thomas A. Edison, Inc. It discusses handling of load units by walkie-type vehicles when limited floor load capacity or confined areas are factors. Illustrations show trucks loading and unloading, tiering and performing other handling operations. The relation of batteries to these vehicles is stressed in the text and in a table showing battery assemblies available for various walkie-types now in production.

32—Centering Reels . . . The F. J. Littell Machine Co. has published a two-color, four-page circular describing its Standard Automatic Centering Reels. They are designed for holding coils weighing from 300 to 6000 lbs. The reels are the automatic centering type and are available plain and motor driven. The centering mechanism enables the machine operator to load conveniently a new coil or change to a different coil. The publication includes several dozen photos, drawings, specifications and operating data. Use the postcard bound into this issue.

33—Portable Bag Closer . . . A folder available from Dave Fischbein Co. contains data on its hand electric bag closer. Weighing 10½ lbs., it operates on any 110 volt line, either AC or DC, and is equipped with a knife to cut the thread after the bag is closed. The closer will handle any textile bag, including asphalt treated or specially processed bags, and most types of paper containers. According to the release, an operator can close up to 20 bags per hour. A suspension unit is available to convert the portable closer for stationary use.

34—Stitching Equipment . . . Bostitch is offering a brochure containing case studies on the use of its stitching equipment. Applications described range from stapling protective wrapping to securing cabin trimming on motor boats. Other uses include fastening assemblies, metal stitching, covering barrels with burlap, sealing bags, assembling seat cushions, and padding shipping crates. The brochure describes the various operations, the type of equipment and the reported savings. A worthwhile publication for those interested in either processing or packaging operations.

35—Scrap Metal Baling Presses . . . Three folders are available from Dempster Bros. on a line of scrap metal baling presses. Detailed operating information, specifications and general data are given. Line drawings show the various positions of the equipment as it goes through a baling cycle. Models are available to produce bales of every desired size, it is said. An attachment is an auxiliary compression door which is designed to facilitate the handling of bulkier scrap by pressing it into the charging box.

36—Hydraulic Truck Cranes . . . Hydraulic truck cranes, with capacities of ¼, ½, one and two tons, are the subject of a folder issued by the Ruger Equipment Co., Inc. Photographs show the equipment mounted on the bed of over-the-road carriers lifting loads such as tires, barrels, axles, pipe and stone. The height of the crane is only 4'11" (the largest model), so that vehicles can be driven through most doorways without removing the equipment from its sockets. The publication includes detailed specifications, line drawings, and operating features.

37—Casters . . . Kilbourne & Jacobs Mfg. Co. has released a 26-page catalog on casters and wheels for use with two-wheel hand trucks and up to 50-ton-capacity industrial trailers. Models include swivel and rigid casters of both stem and plate types, with malleable iron and steel forks. Wheels are offered in sizes from 3½" to 36" in diameter and with capacities up to two tons. Some models have steel rim and wood spoke wheels. The catalog is profusely illustrated and contains many charts, tables and drawings. Copies may be had by mailing the postcard bound into this issue.

38—Batteries for Mine Duty . . . The Gould Storage Battery Corp. has announced a 12-page bulletin entitled "A report of Mine Shuttle Car Operation." The publication based on 95 time studies, gives 22 features of mine shuttle

cars with storage batteries. The first section contains eight tables of field data; the second section discusses safety factors and gives two cost summaries. Many charts and tables.

39—Truck Timer . . . A booklet describing a method for controlling the time element in truck operation is offered by the Service Recorder Co. A device called the Servis Recorder, consists of a pendulum-operated stylus and a spring-driven clock which revolves a circular graph. The side-to-side movement of a moving truck, through the pendulum, activates the stylus which records a wide line and a thin line when the vehicle is stationary. The chart, being marked off in hours and minutes, shows exactly when the truck was moving. According to the release, the Truck Timer is used to check delays, reduce loading time, and check overtime and accidents. The timer may also be installed on other machinery.

40—Job Studies . . . The Towmotor Corp. has prepared two job studies for the chemical process industries and for producers of bottled goods. These reports discuss fork truck operation at two plants and illustrate and describe the methods employed. The folders are divided into two sections, giving the particular problems and the solutions. Savings in manhours and storage space and the labor-aiding aspects of the operations are stressed. These studies may be had by using the postcard.

OPPORTUNITIES

Men wanted Jobs wanted Lines available

Rates: for "Positions Wanted" $4.00 minimum, limit 25 words. For all other classifications $4.50 minimum for 25 words, each additional word 15c; boldface type for all capitals, $7.50 minimum for 25 words, each additional word 20c; limit 50 words. Box address counts as five words. All insertions are payable in advance.

These classified columns are not intended for the advertising of new products by manufacturers, their representatives, or their distributors. These columns are limited to Help Wanted or Positions Wanted advertisements, and for the offering of used equipment by the users of such equipment.

EQUIPMENT WANTED

DOLLARS FOR INFORMATION

We will pay 5% commission on all leads furnished to us, which result in our purchase of used handling equipment, such as fork trucks, pallet trucks, cranes, etc. Inform us of such equipment for sale and we will pay you commissions equal to 5% of purchase price if equipment is purchased.

A. & A. MACHINERY CORP.
1267 Flushing Ave. Brooklyn, N. Y.

USED EQUIPMENT WANTED

Want any quantity of New or Used 2 and 4 Wheel Rubber Tire Hand Trucks; Hand Operated Pallet and Tin Plate Trucks; Hand Operated Lift Trucks; Steel Leg Skids; Gravity Tubular and Roller Skate Conveyors; Motorized Conveyors; Portable Stackers or Elevators; Rubber Tire Wheels and Casters; Semi-Live Skids with 2 wheels in rear; Factory, Counting and Platform Scales in any condition. Security Scale Works, 718 W. Randolph St., Chicago 6, Illinois.

REPRESENTATIVES WANTED

Correspondence invited from well-established distributors of materials-handling equipment and from enterprising sales engineers interested in establishing themselves in business, with regard to representing a distinguished line of industrial cranes and fork lift trucks. Inquiries treated in strict confidence.

SILENT HOIST & CRANE CO.

888 63rd St., Brooklyn 20, N. Y.

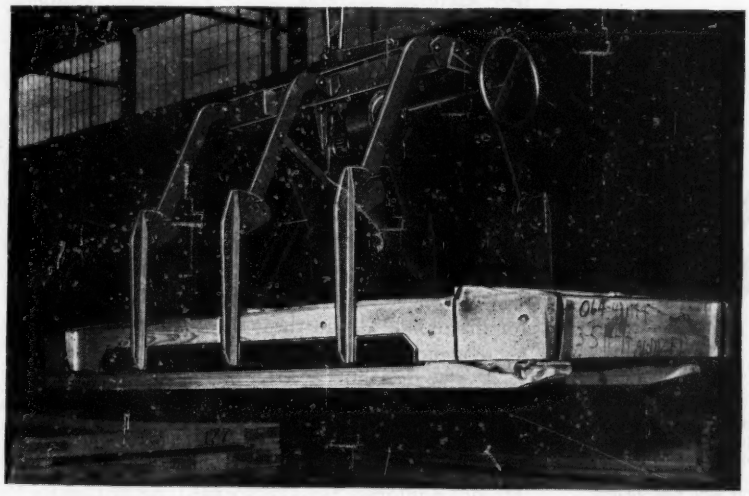
PERSONNEL WANTED

CONVEYOR ENGINEER

An established Chicago manufacturer in the graphic arts field has a permanent position for a fully qualified Industrial Engineer who has specialized in conveyor application. His training should have included conveyor design and installation.

This is an unusually attractive position with a progressive, medium sized, expanding organization offering opportunities beyond his specialty to an engineer acquainted with basic fundamentals of production methods, material handling and manufacturing economics. Starting salary commensurate with training and experience and future based upon accepted responsibility.

Write detailed resume giving age, education, work history and accomplishments. Only complete replies acceptable. Correspondence and interviews will be strictly confidential. Box 4150, FLOW Magazine.



HERE'S SHEET HANDLING ECONOMY

No better demonstration of the efficiency, flexibility and economy of C-F Lifters can be made than to watch this 5 ton C-F Lifter handle *all* sheet steel movement in this busy Chicago district warehouse.

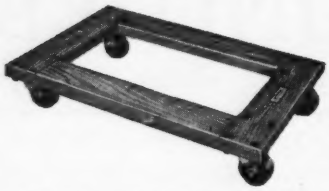
C-F Lifters have quick opening jaws with infinite opening and closing adjustments, permitting them to handle a wide variety of sheet widths—wide bearing angles that safely lift sheets without crimping edges—end control to permit close quarter operation—positive jaw controlling mechanism that holds the jaws open in any position—these and many other exclusive features make C-F Lifters a good investment in materials handling equipment.

C-F Lifters are made in manual and motor operated models in sizes to handle from 2 to 60 tons in standard and semi-special designs.

Write for the Bulletin "C-F Lifters"—it describes the advantages and economies C-F Lifters can bring to your sheet handling jobs.

CULLEN-FRIESTEDT CO.
1320 S. Kilbourn Ave., Chicago 23, Ill.

DOLLIES & TRUCKS



● A general purpose dolly with open frame and flush top. Light and easy to carry yet capable of handling heavy loads. Equipped with four swivel casters having 3" semi-steel or rubber tired wheels.

★ Ironbound material handling representatives are located in all important cities. These men can help you with all handling problems involving the use of standard Skids, Semi-Live Skids, Floor Trucks, Roll Handling Trucks, Dollies or specially designed adaptations to meet particular requirements.

IRONBOUND

FLO TRUK

● Popular as an all-purpose general merchandise unit. Ruggedly constructed — selected hardwood deck. Equipped with rubber tired or semi-steel wheels.

Ask for Catalog GP-7

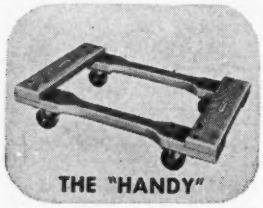
Ironbound

IRONBOUND
BOX & LUMBER COMPANY
Materials Handling Division
30 HOFFMAN PLACE • HILLSIDE, N. J.

SKIDS • SEMI-LIVE SKIDS • DOLLIES • FLOOR TRUCKS

DOLLIES, SKIDS, TRUCKS

Built to meet all tough requirements



THE "HANDY"

● IRONBOUND DOLLIES

The "Handy", one of a full line of dollies, has shaped frame for comfortable hand grip. Equipped with four swivel casters. 3" dia. wheels—choice of steel or rubber.

BARREL SKIDS

Selected hardwood rails reinforced entire length with flat steel bars. Standard models are 16" wide; 8' to 16' long.

Ironbound engineers will help you with your handling problems. We design and build super structures to handle special products at lower handling costs.

ROL TRUK

● The RolTruk will "pick-up and go" with paper rolls, drums, barrels, etc. Available in several models with capacities ranging from 500 to 2000 lbs. Ask for illustrated bulletin 10RT.

Standard line of Ironbound Skids, Semi-Live Skids, Dollies and Floor Trucks is fully illustrated in Catalog GP-7. Write for a copy, today.

Ironbound

IRONBOUND
BOX & LUMBER COMPANY
Materials Handling Division
30 HOFFMAN PLACE • HILLSIDE, N. J.

SKIDS • SEMI-LIVE SKIDS • DOLLIES • FLOOR TRUCKS

ON THE PALLET . . .

(Continued from page 48)

Iowa Engineering Society. One director and one officer of Bell Aircraft Corp. have been elected to the board of directors of the new company. Actual transfer of the Prime Mover business has started. The equipment, a powered barrow, was formerly manufactured and marketed by the Bell Aircraft Corp., Buffalo.

A NATIONAL survey of projected purchases of manufacturing equipment has been completed by the American Society of Tool Engineers, Detroit, in connection with plans for the technical society's Industrial Cost-Cutting Exposition in Philadelphia this April. The survey reveals, among other things, that purchasers of new material handling equipment will be a major factor on the 1950 budgets of many manufacturers of all kinds of products. Of all companies reporting, 27 per cent indicate they are planning important purchases of such equipment in 1950. Large companies continue to represent the best market. Of this group, 57 per cent of those reporting reveal that they are planning to add material handling equipment in 1950 to reduce costs. Seventy-nine per cent state that they will spend more in 1950 than they did in 1948 for all kinds of cost-cutting equipment.

Among medium-sized firms, those normally purchasing from $10,000 to $100,000 worth of new equipment annually, 27 per cent report that they plan to purchase new material handling tools. In smaller companies, the corresponding figure is 22 per cent.

The 19th AMA annual Packaging Exposition is expected to be the largest so far. It will be held on Chicago's Navy Pier, April 24-27. More than 240 manufacturers of machinery, equipment, materials, supplies and service will show their products. According to AMA's Packaging Vice President, the packaging, packing and shipping industry is well on its way this year to an annual dollar volume of more than $7,000,000,000. The wide diversity of subject matter for discussion at the three day Conference is offered as evidence of the steadily growing importance of packaging.

The subject matter of the Conference has been selected on the basis of the returns of the questionnaire sent to 1000 companies in diverse industries. Majority interest remains focused, according to Malcomson, in reducing production costs, increasing sales and the quality of the product. The Exposition and Conference are designed to give those attending an opportunity to find solutions for their particular problems.

At the six Conference sessions, held under the same roof with the Exposition, authorities will scrutinize problems of packaging, packing and shipping (as indicated by the survey). More than 25 experts will lead discussions on the latest techniques as a guide to improved practices throughout the industry.

Professor
S.I.P.M.H.E.
Reminds You!

"Help celebrate the 5th anniversary of the wedding of Protective Packaging and Materials Handling!"

"Yessir, the marriage of Protective Packaging and Materials Handling has been a happy one—of great benefit to commerce and industry.

"So, don't forget to exhibit—attend—celebrate at our anniversary—the 5TH ANNUAL (and biggest ever) INDUSTRIAL PACKAGING AND MATERIALS HANDLING EXPOSITION—*the only show that ties together Protective Packaging and allied Materials Handling equipment* —at Philadelphia's Convention Hall, October 10 to 12, 1950.

"Added features include the National Protective Packaging Competition and the 5th Annual "Short Course" conducted by Community College, Temple University.

"There'll be a big crowd—people you want to meet—buyers you want to sell. You'll get results. Write or wire for details today!"

SOCIETY OF INDUSTRIAL PACKAGING AND MATERIALS HANDLING ENGINEERS
20 W. Jackson Blvd.,
Chicago 4, Ill.

PALLETS For Every Need!

Whether you need a lightweight shipping pallet, or a 12-foot heavy duty pallet for 10-ton loads, we can supply a RAZORBACK Pallet made to your specifications.

Get our present low prices on quality pallets. Shipments will be made WHEN PROMISED!

Arkansas Pallet Corp.

P. O. Box 794-A Phone 6474

PINE BLUFF, ARKANSAS

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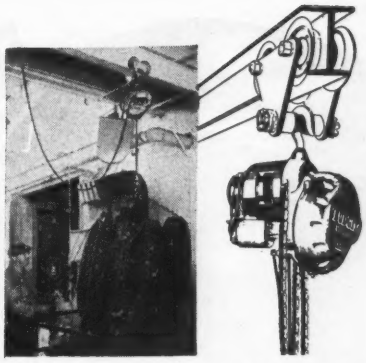


. . . sure savings!

Lifting on production, assembly, and inspection lines can be costly in time, money, safety, when it takes all your workers' strength and energy to do it.

Let a light, speedy, easily operated 'Budgit' Electric Hoist lift your loads — machine parts, machines, tools. They lift so fast, so quickly, save valuable minutes in every working hour. They husband the workers' energy — allow him to turn it into increased production. They safeguard him from strain, rupture, over-fatigue.

There's no installation costs with a portable 'Budgit' Hoist. Just hang it up, plug into the nearest electric socket, and use! That's why whenever materials handling is a goodly part of the day's work — in factories, warehouses, loading and unloading platforms, on farms, in dairies, shops of all kinds, hospitals, stores, schools, or anywhere loads must be lifted — a portable 'Budgit' Electric Hoist saves time and money for its owner.

Available for all standard electric currents in a wide variety of speeds. Capacities: 250, 500, 1000, 2000, and 4000 lbs. Prices start at $119. Write for Bulletin No. 391.

MAXWELL MANNING MOORE TRADE MARK

'BUDGIT' *Hoists*

MANNING, MAXWELL & MOORE, INC.
MUSKEGON, MICHIGAN

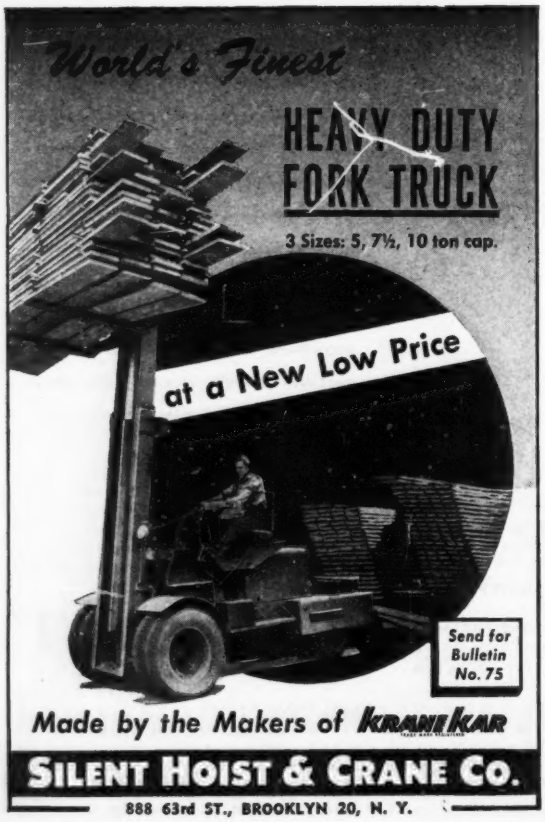
Builders of 'Shaw-Box' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, 'American' Industrial and 'Microsen' Electrical Instruments.

... the Superiority
of A-F ENGINEERING

A simplified method of moving finished TV sets from the production line to selected A-F Belt Conveyors running to and from testing booths to storage or shipping docks . . . and keeping the aisles clear by moving the assemblies overhead on A-F Trolley Conveyors . . . reduced costs for this television manufacturer. For information regarding modern products-handling methods, write today.

THE ALVEY-FERGUSON COMPANY
434 Disney Street Established 1901 Cincinnati 9, Ohio
Offices or Representatives in Principal Cities—Coast to Coast

CONVEYING EQUIPMENT
Alvey-Ferguson
WASHING MACHINES FOR INDUSTRY



Made by the Makers of KRANE KAR
SILENT HOIST & CRANE CO.
888 63rd ST., BROOKLYN 20, N. Y.

Literature Available From Advertisers In This Issue

(Check corresponding numbers on the enclosed card for the free literature listed below).

A-1. THERMOID CO. will send information on conveyor belts, hose, brake linings and other of its products. Use the card bound into this issue.

A-2. STREATOR DEPENDABLE MFG. CO. A catalog contains data on the company's line of stacking bins.

A-3. BASSICK CO. Use the postcard bound into this issue for information on its line of casters.

A-4. THEW SHOVEL CO. is offering a 24-page catalog containing case studies of self-propelled cranes and trailers.

A-5. RUGER EQUIPMENT CO. will arrange a 10-day free trial of its hydraulic floor crane. Use the postcard in this issue.

A-6. LINK-BELT SPEEDER CORP. Book No. 2503 contains data on industrial applications of its shovel-cranes.

A-7. JOHN A. ROEBLING'S SONS CO. "Roebling Sling Data Book" tells about slings and sling accessories. Send the postage-free card in this issue.

A-8. GENERAL BOX CO. Use the postcard in this issue for information on wirebound, wooden, cleated and corrugated containers.

A-9. THE PRIME-MOVER CO. will send facts on its Prime-Mover, a powered barrow, also the nearest distributor.

A-10. BAKER-RAULANG CO. Publications covering its line of powered rolling equipment are offered. Use the postcard.

A-11. LEWIS-SHEPARD PRODUCTS, INC. Bulletin No. 25 gives data on its line of fork trucks and other handling equipment.

A-12. FAIRBANKS CO. is offering data on hand trucks, dollies, jack and platform trucks and case trucks.

A-13. YALE & TOWNE MFG. CO. will send publications covering its line of hoists, scales, hand and electric trucks.

A-14. DEMPSTER BROTHERS. Information is offered on its truck chassis used with 37 interchangeable bodies.

A-15. ALLIED STEEL & CONVEYORS, INC. Use the postcard for publications dealing with engineered conveyor systems.

A-16. ROWE METHODS, INC. will send information on its Adjust-A-Docks, hydraulic truck docks. Mail the postcard.

A-17. KWIK-MIX CO. Bulletins contain data on powered barrows with a 10-cu.-ft. hopper or 1200-lb. flat bed.

A-18. TRUSCON STEEL CO. Available for the asking is an illustrated catalog on its steel boxes and skids.

A-19. DETROIT HOIST & MACHINE CO. Bulletin 810 gives information on an electrically operated monorail tractor.

A-20. COLSON CORP. A 56-page catalog covers the company's line of casters, industrial trucks and lift jack systems.

A-21. INTERNATIONAL STAPLE & MACHINE CO. Publications describe economies with its top and bottom stapling machines.

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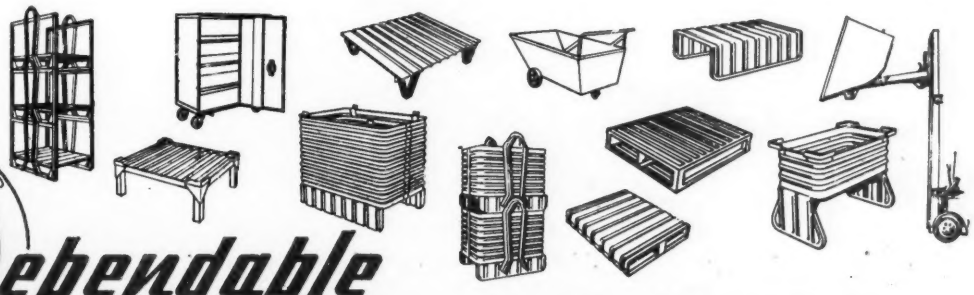

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